Encounters with the Information Society

Personal and social issues in the appropriation of new media products in everyday life: adoption, non-adoption, and the role of the informal economy and local experts.

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Declaration

The material contained in this thesis is my own work, has not been published elsewhere, and is an original composition.

James Stewart……..

Abstract

This research introduces a novel methodology to study the appropriation of new Information and Communication technologies (ICTs) or 'Multimedia' in a natural setting**.** Building on theoretical and empirical research in technology studies, diffusion of innovations and consumer research, the study investigates the processes of adoption, consumption and domestication across the life-space of individuals and natural groups. The BEAN approach is developed to investigate data from qualitative fieldwork that engaged with respondents in four natural social networks. This shows how a range of new ICTs are entering into the everyday world of these respondents, and how they engage with them: the way these technologies are appropriated, including adoption, learning and struggling, but also strategies of resistance, non-adoption, and arms-length appropriation. It shows the importance of the *informal economy* in providing access to technology, skills, knowledge and resources to deal with the complexities and difficulties of adopting and using ICTs. In particular, it finds the *local expert* is crucial to the adoption and use of many of these technologies, providing support that the commercial world fails or is unable to provide.

Contents

Chapter 1 Introduction: Encounters with the Information Society

The development and adoption of new ICT technologies and the social, cultural and economic changes that seem to accompany them are seen by many as a revolution. It is an astonishing phenomenon that will certainly bring many personal and organisational benefits including efficiency, productivity, control, security, flexibility, and opportunities for engagement with people and the world. However, many people are also unsettled by these developments. The 'revolution', if it is such, raises questions about undesirable effects on individuals, communities, of larger uncertain social change, and the seemingly uncontrolled appearance of new technologies in everyday life.

Everyone is being exposed to these new technologies, the ideas surrounding them and the effects of their implementation by others. While particular technologies, applications, visions and companies may come and go, new relationships, way of seeing the world, classes of use and industries are emerging. How is this happening? Governments and industry may be making the big decisions and investments, but they do not do so alone. Decisions about new technology and its application are taken by everyone, however much power they wield, and in a market these decisions add up, affecting, to a lesser or greater extent, 'sociotechnical' change. Behaviour and decisions are informed not only by rational decisions based on information from 'proper' sources, but from everyday lived experiences, imaginative images, personal and institutional sources, personal and accounted histories, and worked out through relationships with people, organisations and with the obduracy and affordances of the physical world. This is expressed to industry as the 'consumer power' of the mass market, taking new information technologies from technical subcultures and highly specialised industries into global culture and the everyday working and home lives of the majority of the population.

1.1 Perceptions and Reactions to the 'Information Revolution'

As a starting point for this study I engaged with themes identified in the literature on the 'information society'[1], such as globalisation, virtual society, the knowledge economy, flexible working, life long learning, changing boundaries and convergence, and more general theory on technical change such technology out of control and democratisation of technology. With this in mind, I wanted to find out what people feel and think about this phenomenon specifically and in general. Is it generally recognised as a major issue, a special period in history, or just technical and social change as normal? Is it related to political issues, are there issues of quality of life, equality of opportunities and cultural identity? Are these technologies and their application seen as a challenge to cultural norms and do they raise moral questions about behaviour and relationship? As analysts, especially academics steeped in critical engagement with society and in continual contact with the developments and applications of new ICTs around the world, it is useful look from 'ground level' and put these positions in perspective. It is important also to move away from our own situation: our continual engagement with information, especially written texts, participation in wide and often global communication, and a privileged access to many of the cutting edge technologies and tools which we are meant to be studying objectively.

1.2 Personal and practical engagements

The body of the study and its findings concentrate on how individuals engage with and experience new ICTs in practical and meaningful ways. How do they come into our personal, everyday spaces, through work, the media, our social network and our local environment (Chapter 5)? When are these technologies peripheral and when and how do they become *relevant?* Some people practice avoidance, others embrace technical innovation. Some see it as an unfortunate necessity, others as an opportunity for creation and liberation. For most people there are two sides to dealing with technology,

the struggle, the cost, the time and energy needed to development expertise (Chapter 7), and the benefits, such as flexibility, control, access to information, people, and self expression. There may be many unanticipated changes in activities and relationships through use of technology, both positive and negative.

Like the telephone and car before, these mass market developments of the computer, mobile phone, Internet and other systems appear not to respect boundaries between home and work, rich and poor, artist and scientist, men and women, child and adult. However, while technical development may lead to similar systems being used by many people, it does not imply that everyone has the same approach, opportunity or attitude to the new technology. What are these differences, how do different people appropriate and find their own accommodation with new ICTs?

ICTs can both cross boundaries, and create or reinforce boundaries at practical and symbolical levels. They bridge different cultural, economic and social worlds, and give people and organisations the opportunity to reach across into the world of others. Throughout the study I will highlight the changes and importance of boundaries in facilitating and restricting change, and how we as analysts and those that we study can re-evaluate our existing conceptions and experiences of boundaries in everyday life.

1.3 Coping with new ICTs

Many people have to engage directly with these new technologies. This happens in many contexts, and everyone is able to draw on different resources to deal with them. In particular, knowledge and expertise is called for in making decisions and use of ICTs. Use of the technologies by ourselves and others also challenges many accepted or controversial cultural norms. How are these challenges met? In particular, I look at the processes involved in the technology entering everyday life, not only at the point of purchase, for many people do not buy these products, but processes of knowledge development, of coping with the imposition of technology, of living

along side it, of avoidance, and of vicarious experience. Of particular importance I suggest is the personal social network or community. Personal contact has long been recognised as the dominant factor in formation of attitudes and the adoption of innovations, be they technologies or ideas, and the *social network* is one of the principal resources for personal support. However in the modern society, with many commercial pressure, innovations being largely produced by remote industries, and imposed through organisations at work and in education, what is the role of close and informal social relations? I propose that the social network is central to the adoption and the continued use and domestication of new ICTs and multimedia. The *informal economy* of artefacts, ideas and knowledge, between people who share activities, interests and histories, is the essential foundation for the wide spread appropriation of new ICTs (Chapter 6). Within this informal economy there are certain people who are relatively more knowledgeable or experienced with using ICTs, and they are often seen as playing a special role, as an opinion leader, or knowledge broker in the adoption process, and in providing on going help in the use of and upgrading of ICTs to those in their social network. I identified these people as being *local experts*, individuals who play a key role in support of ICT use and adoption in a social network (Chapter 8)

1.4 New ICTs in Context: information, Communication, and Society

All technologies are tools for some activity. However while developers of tools may design them for particular uses, applications, users and use environments, it is well recognised that as circumstances change and different people come to use them, then they can be put to previously unimagined uses. New technical systems are also put to work alongside other technologies, so we must look at how they replace or complement existing systems. Technical artefacts are also more than tools, they are given meaning by developers, users and non-users that is only partially based on their functional application. To understand the uptake and application of

particular systems and artefacts we must look for the meanings they are given in the context of other technologies and social institutions and relationships that shape and govern their production and use[2].

Many ICTs are 'new media' or 'multimedia', a series of innovations that have as much to do with content, information and communication as hardware and software. Multimedia appears to be expanding the importance of information and communications in society and in the economy. The power of technology to help us to know and 'mis-know' the world and to speak and 'mis-speak' to each other is phenomenal. Activities of communication and information gathering, manipulation, trading and application are key to many of our activities. To understand the adoption and development of these new technologies, they have to be seen in the context of these activities and the lives and ideas of those who engage with them.

I conducted an qualitative study of the lives of a number of people living in a small industrialised country, Scotland, at a time of supposedly immense technological and social change to see how these people were experiencing this change. I tried to understand the respondents approach to and use of new technologies, their personal relationships, communication, uses and creation of 'information-based' products from works of art, and multimedia products through scientific data, to student records and class essays), use of existing technology, and the resources and expertise they could muster and develop to engage in these activities and relationships. I looked for important events, life changes and relationships, surprises and disappointments, and the or balancing of priorities and resources. Underlying all this I looked for expressions of basic values and the attempt to relate social and technical change to interpreting and maintaining those values (Chapter 4).

These activities and events and values provide the context of and shape the reactions to new technologies, and it is through these that we can start to understand the way individuals appropriate new ICTs. However the creation or 'construction' of meanings and uses does not come exclusively from the 'end users': we have to look at their interaction with *affordances and limits of*

technologies and the uses and systems proposed by the supply industry and all those that we come into contact with who also create uses and meanings.

Given the industry hype, I could have expected all the respondents to be fully kitted-out members of the information revolution by the time I had completed the study, but in reality I was able to observe a range of experiences. My initial hypothesis was that few people would be able avoid the dramatic increase in use and discussion of new ICTs, whether they wanted to or not. Whether it be through friends, family, work, dealing with commercial and government organisations or through the media, it would be very hard to avoid engaging in at least some way with the phenomenon. For this reason I wanted to avoid the trap of focusing on one technology, or one domain of life, such as work or home, where it was quite possible for someone never to encounter the new technology. Indeed, by looking across domains and technologies I would be able to see the influences across boundaries and between products. I also wanted to avoid talking only to people who were 'adopters' at the beginning of the two year study; the implication of the 'information revolution' was that computer technologies were no longer the realm of the specialists, programmer, the data processors, early adopters and the young, predominantly male technology enthusiasts, Everybody would be adopting some of these new products and services. If this were so, I wanted to understand how it was happening, and the who, why, when and what of the emergence of a new generation of mass market technologies and the almost inevitable social changes that accompanying the process.

1.5 Following the Multimedia Revolution

The study is set within a broader discourse that was at the time called the 'multimedia revolution', what is now called the 'Internet revolution', and has been more generally called the information technology revolution for many years[3]. This is based round not one, but a huge constellation of innovations (Keirstead (1948) quoted in (Freeman, 1988)) that could be said to have introducing a new 'techno-economic paradigm' (Dosi, 1982; Perez, 1983;

Freeman, 1988). While there a clear change in industry and the way industry is organised, there have been many discussions about whether there is a revolution in *society* coming about as a result of new ICTs, and how it will happen over the past 40 years. Technology and social visionaries have made many predictions for ways that this technology could transform the world, for the better or for the worse, based on both technical and media determinist and more constructivist approaches (e.g. (Bell, 1974; Lyotard, 1984; Lyon, 1988; Miles, Rush et al., 1988; Castells, 1989; Poster, 1990; Reingold, 1994; Webster, 1995; Bolton, Johnson et al., 1996; Graham and Marvin, 1999) etc). The vision of the possibilities of new ICTs has long been a theme of government policy in industrial and national development (Arnold and Guy, 1986). The last significant impulse for this occurred in the mid-1990s when the US government launched an initiative called the National Information Infrastructure (NII, often called the Information Superhighway, (US Administration, 1993)) with the aim of stimulating the US IT industry and the application of ICTs across industry, the domestic and public service markets (Bar, Borrus et al., 1994). This was quickly followed by similar initiatives in other countries (Kahin and Wilson, 1997). Whether it made any difference is unclear, but it appeared to focus many people on the possibilities that a range of digital information and communications technologies had got to a point were we could envisage their convergence and application in every area of the economy, government and society. However there was still considerable uncertainty about how it could be used, in what form, and by whom.

Central to this government and business policy were visions of particular applications (many of which are not particularly new), and on particular technological systems were being developed at the time. Applications included work organisation, especially telework, the provision of electronic government, transport, medicine, military, shopping, home management and the smart home, entertainment, communication, community, banking, the military and so on. These are shown in Figure 1. Among technology systems

the Internet was starting to develop (Naughton, 2000), although it was rather more popular among end users than industry than, for example, interactive television, which was the favourite investment sink of telecommunications, cable TV and television companies (Carey, 1996; Stewart, 1999). Liberalisation of telecommunications markets, the beginnings of globalisation and the increasing outsourcing of data processing and telecommunications were causing a great deal of excitement in that industry, while in computing, the personal computer was becoming every more powerful, and with it certain firms who appeared to have a licence to print money.

At the time of starting this research I was engaged in writing up a series of reports looking at the future of multimedia technologies from an analysis of sectors and regions (FAME 2010+: Forecasting the application of Multimedia and its environment to 2010 and beyond.) (Stewart and Williams, 1998), and had recently finished an MSc dissertation looking at the interpretation and reality of multimedia across the range of industries that were supposedly converging under the influence of multimedia technology (Stewart, 1994). From this research it was clear that technology industries were extremely bullish about the development and uptake of ICTs. This intensified with the massive growth in Internet use, and eventual conversion of industry and government to believing that it would deliver where proprietary systems had failed. The Internet came to dominate every other technology as the key *pole of attraction* (Stewart, 1998; Williams, Stewart et al., 2001) around which all other services and technologies were being aligned.

In starting this study in 1996 there were vast number of technologies and services being launched, many of which looked extremely hopeful. It appeared to be a classic case of the Schumpeterian model of an explosion in products inspired by the apparently infinite possibilities of a new set of basic technologies (Elliott, 1980). It seemed that over a period of 2-3 years many people would have adopted not only basic technological tools such as the PC and the mobile phone, but would also have tried and maybe be using home shopping, home banking, be teleworking etc. Most companies would also

have some presence on the Net. All I would have to do would be watch how the story unfolded. However this did not happen. True, many people adopted these technologies, and many services were launched. But the actual percentage of adopters, and the number of services compared to provision 'off-line' was still quite low. Many people were also blissful unaware of many of the innovations 'behind the scenes' and had rather a low awareness of those front of stage too. Many people also resisted or rejected innovations that seems to complicated, irrelevant, or unnecessary, developing a number of strategies to do this in the context of their social network and activities (Chapter 9 and 10).

As is clear, and this research demonstrates, in the huge inventive rush, many innovations just failed to reach the market, satisfy the needs or inspire the interest of potential users: "On the purely technological level, innovations in their early stages are usually exceedingly ill-adapted to the wide range of more specialised uses to which they are eventually put." (Rosenberg, 1983, p.111)[4]. However, some, such as the mobile phone and the personal computer had moved past the stages of early innovation and adoption, and were becoming accessible and relevant to many individuals and organisations. It must be noted that this research was undertaken before the 'Dot.com' boom and bust, and mass adoption of the mobile phone that occurred in 2000-2001, but these should only be seen as particular events in the gradual process of innovation and diffusion of a much greater range of technologies and services, for which the findings of this study are still relevant.

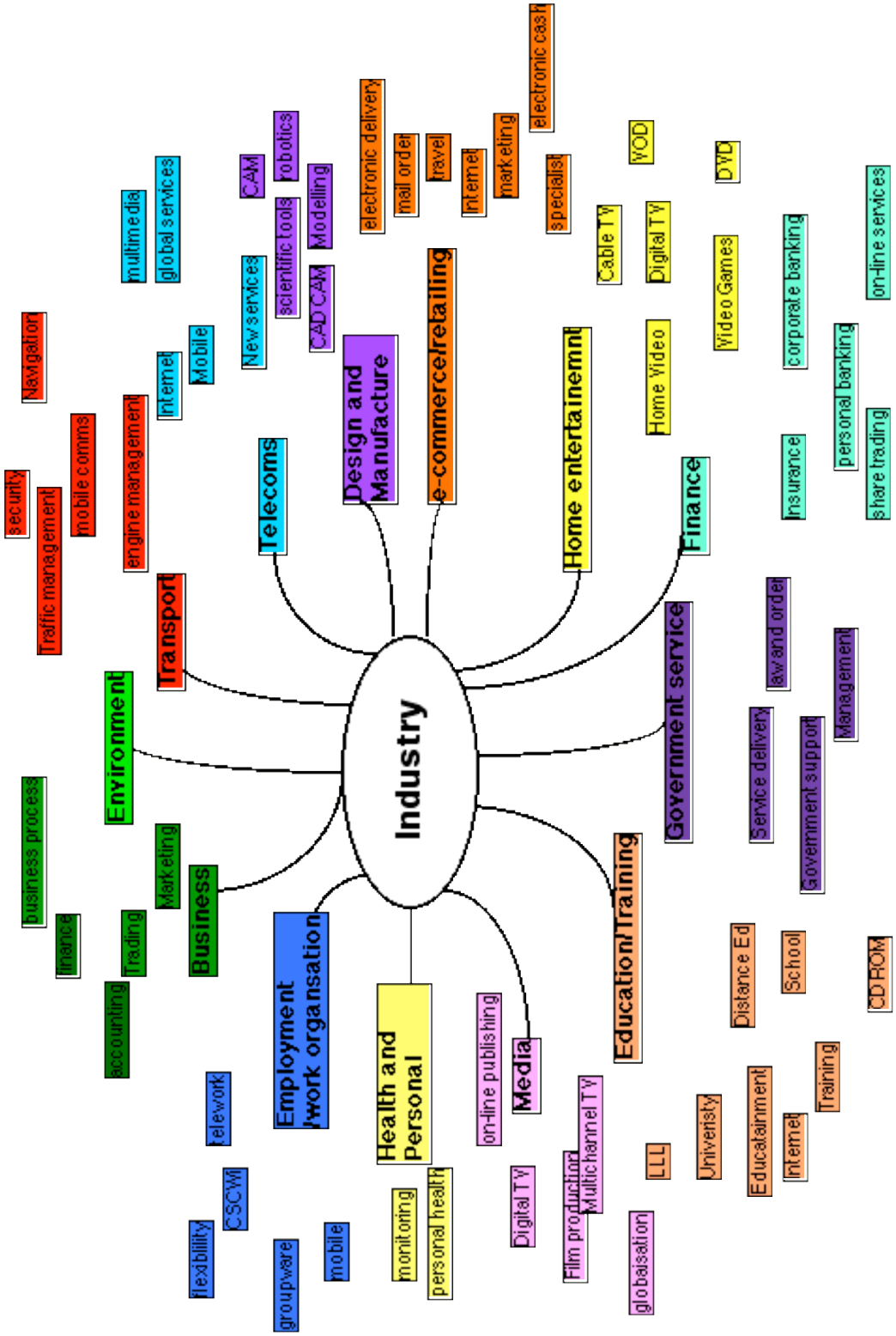


Figure 1 Some of the applications of multimedia across industry

Chapter 2 Literature Review

2.1 Introduction

This research arises from a background of technology studies, especially the idea of the social shaping of technology (SST) (Williams and Edge, 1996). SST places the analysis of technology in a social environment, and also asks that we understand all social relationships in the context of the material and technical world which permeates the cultural and social. A particular area of technologies studies that inspired this research looks at media communication and information technologies in the home, and this was the basis of the research questions and design. However during the course of the five year study a great deal of literature from outside this discipline was brought in: from cultural studies, consumer research, diffusion of innovation research, leisure studies, urban and community sociology and many more. I also took part in other parallel studies that covered similar issues, bringing in new insights to research questions. This chapter introduces some of this literature, its theories and findings in a way that will inform the reading of the empirical work presented in the following chapters. This review was written after the field study and analysis, so the comment and development of the ideas is not only a reflection on the literature, but also on insights from the study.

2.2 Engaging with the Information Society[5]

The new arrival of multimedia technologies including the Internet, mobile and telephony services, and their various applications are part of a revolution similar those that occurred at earlier innovative periods that saw the development of stream power, antibiotics, electricity, radio and television, the internal combustion engine, and the telephone. These established technologies all appear to have provoked considerable changes in society and in our everyday lives. However, they all emerged within a period of

considerable social change, and many histories have shown how events and situations pushed forward the development and adoption of technologies that met the demands of the time. Today we are in a similar situation. Technology is associated with many aspects of social and economic change today, but unravelling cause and effect is arguably an impossible task. Instead we have to refocus, and see the process as 'sociotechnical' change. We are all being asked to accept change in our lives and business. Producers of products and services have to realise that society is changing and they must produce products and services to satisfy citizens and consumers in the 21st century.

Many innovations affect our lives. Sometimes we have a choice about how we engage with them – we can choose to adopt a technology or use it in a particular way. In many other cases we have no choice – we can not afford it, someone else adopts on our behalf, or we are obliged to learn new skills and adapt to the demands of modern life by using new products. However, although we may often be under pressure, the way we *appropriate* is shaped by our local environment and relationships, and our everyday activities and interests, and personal life goals and themes. The study of consumption of technology is the study of how we engage with innovations, what they come to mean to us, and how we negotiate the way they shape our lives. It looks at how we appropriate the products of industry and try and make them our own. Industry needs to understand what sense products and services make once they 'get out there', so they can exploit the consumer experience of our services and products. Consumers or users innovate as well as producers, and the problem of accepting change applies to everyone whether they design or use a product. Consumers, at home, at work, can be more aware of the different ways innovations are consumed and reinvented, and play a more active role in the change process, making innovation work for them.

2.3 The Consumption of Technology

Consumption of technology has become an important part of understanding the place of technology in society. Apart from its intrinsic interest,

understanding consumption is important to understanding the entire innovation process, particularly in open markets. Consumers play an important role in the selection and innovation of products that feeds into the innovation cycle, especially in the formative stages of their development (Collinson, 1993), just as industrial users innovations are key to product development and diffusion (Fleck, 1988)[6]

A basic definition of consumption is the selection, acquisition, use, maintenance, repair and disposal of goods and services. This only a framing definition; I wish to include the use of media content, and ideas such as repair and disposal cannot really be applied to services or media in any sensible way. Indeed 'consumption' may not be the most appropriate phrase to cover all these activities, especially as it implies the 'devouring' of goods[7], and many of the products are not consumables, but capital equipment or consumer 'durables'. Nonetheless, consumption is useful as a label for many activities and dimensions of the innovation process which are not included in the concept of *production.*

Consumption has been an issue which until recently has been largely ignored by most academic disciplines. It has been widely defined as an economic activity, in which the consumer is the passive object of the producer. It has never had a positive or sophisticated image[8]. Academics are not only ones who have a particular view of consumers. Industry generally treats consumers as a people to be categorised and exploited. The main business of companies, and the focus of most efforts is on the design and production process – dealing with technology, management, finance. Even marketing is often an extension of production – trying to manipulate the market and consumers to fit the product or service. Only in recent years has a customer-oriented approach started to be developed in all but a handful of industries and companies. This means taking the consumer seriously and learning from and with their innovations, buying into the modern American commercial myth that the 'consumer is king'.

In recent years consumption has entered sociology, taking a lead from cultural anthropology, which emphasises the symbolic nature of goods and their place in culture, focusing on the ritual nature of material artefacts over their practical use (Douglas and Isherwood, 1979, 1996; Campbell, 1995; Miller, 1995; Sulkunen, Holmwood et al., 1997)[9]. This cultural approach to consumption recasts it as an 'active' process of appropriation and interpretation. Consumers of goods and services and the audience for media are no longer passive, but appropriate 'commodities' and interpret then in their own ways. As cultural studies has it, the consumer is a 'bricoleur'[10], a tinkerer, engaged in a 'multi dimensional process of negotiation involving humans and non-humans.'(Akrich, 1992). This active interpretation emphasises non-economic aspects of consumption, the cultural context, but in two contrasting ways: *constrained consumption* suggests that cultural, and particularly class factors limit the what and how we consume, as in the structural model suggested by Bourdieu[11] (Bourdieu, 1984); and *creative consumption* (Hebdidge, 1979; De Certeau, 1984; Fiske, 1989) suggests we can understand consumption by subcultures as a series of strategies of resistance and counter-power. Miller develops the idea of 'objectification'[12] in a theory of consumption that emphasises the transformation of industrially produced and 'alienated' commodities into part of our own inalienable culture (Miller, 1987). This approach is 'optimistic', we are not the slaves of class or industry – through consumption processes we appropriate goods from the highly specialised world of industry and make them part of our local and global cultures[13]. However, even 'creative' consumption can have limits: the power of the individual consumer in the circuit of production and consumption (Cockburn, 1992). is very limited compared to the producers. De Certeau suggests that we are restricted to using limited 'tactics'[14] of 'making do' in the face of corporate strategies: "The rationalised, expansionist, centralised, spectacular and clamorous production is confronted by an entirely different kind of production called "consumption" – characterised by its ruses, its fragmentation, its poaching, its clandestine nature, its tireless but quiet

activity, since it shows itself not by its own products but in an part of using those imposed on it." (De Certeau, 1984, p.32).

It is clear that a general theory of consumption has to embrace aspects of both approaches: there co-exist constraints and creativity in consumption (Moores, 1995). To understand and examine this we have to look in detail at consumption practice. Constructivist theories of technology (e.g. (Bijker, Hughes et al., 1987) theorise the affordance of technology in use, both practically and symbolically, and empirical work demonstrates that in use and innovation there is *interpretative flexibility*. Technologies and technical artefacts are given different meanings and uses by different people, and these change over time. Meanings are not fixed, but neither are they developed independently by different groups. Instead there is a constant interchange and mutual influence. The alternate interpretations and power of different groups affect the innovation process and the way the technology manifests itself in different systems and products. Constructivist theories contextualise consumption within cultural and socio-economic setting: family, community, workplace, nation etc. Meanings are constructed in use and expectation, but these meanings also are constrained by the setting. This approach was originally developed to study technologies in development, but has also been applied to technologies in use (Akrich, 1992), in particular, in the domestic sphere (Silverstone, Hirsch et al., 1992; Aune, 1996; Lie and Sorensen, 1997a). It is important to take into account the influence of the technologies themselves – meanings are not entirely fictions developed by human actors, but emerge in response to the technical systems, knowledge and artefacts themselves, as important 'actors' in their own right (Callon, 1991), which through their affordances (Gibson, 1979) and obduracy play a part in shaping social relations and processes.

With this approach we can no longer can draw a clear line between consumption and production in saying where a product is created. Invention and innovation are clearly not restricted to the producer side of the economic equation. Consumers 'reinvent' technologies, we 'redefine' technologies with

new meanings, and find new uses (Pinch and Bijker, 1987; Fleck, 1988; Rogers, 1995). By tracing this 'reinvention' or 'redefinition' we gain some insight into the social and cultural setting of a technology[15]. The general message from these studies is that we have to move away from looking at production and invention, to focus more on appropriation and signification as an essential part of understanding how and why technologies take on such importance in our lives.

2.3.1 Consumption, the Domestic Space and Everyday Life

What sets the study of consumption apart from studies of the use of technology in organisations is the focus on the home, and family and the domestic environment. The home environment is also a very particular space and social unit. In conventional terms it is the 'private' world: the world of the family, close personal relationships, love, sex, entertainment, children - the traditional '*woman's* realm' where every *man* is his own king! A number of research agendas have lead to the study of domestic technology: Study of consumption of 'commodities 'and material culture, Gender studies, Teleworking, Audience and media research, Historical studies of media and communications technologies, Consumer studies and marketing and Diffusion of Innovations research[16]. The convergence point of many of these research programmes is ICTs, for these are the some of the most common and most problematic technologies. As well as being artefacts they are often telecommunications tools or media technologies: in the home they provide links within the household and between the household members and the outside world (Silverstone, Hirsch et al., 1992), and outside the home, between individuals, and within communities and organisations.

An important feature of new ICTs is that they cross boundaries between areas of life such as the home and the workplace in several different ways: the Internet, the PC and the mobile phone are not exclusively professional or domestic products and indeed they are increasingly being used by consumers to blur the lines between home and work. We have to find a way to situate the use of technology within the broader context of how we

technologies become embedded in all areas of life: how 'technology is adapted to everyday life and the everyday to technology' (Sørensen and Berg, 1991), how it takes its place in the home, the workplace, the city with and across cultures. Some researchers use the same term as is applied to the taming and breeding of animals from the wild to home or farm life: Domestication. By studying how a technology is 'domesticated' we reveal something about the home, workplace or community, the relationships of people within that space, and their relationships with the outside world (Silverstone, Hirsch et al., 1992). With this understanding we can go on to approach the problem of the consequences of new technologies.

2.4 The Adoption of Innovations

While the technology studies and the 'domestication' of technology literature based in cultural studies of media provided the initial basis of the research, the questions raised in the study point the way to a range of other literatures that investigate similar issues. In particular, there is a need to understand the processes of adoption of products, and why we adopt, as much as to understand the following domestication process. The main body of literature that addresses this is consumer research[17].

Consumer research covers six main areas:

1. People as consumers, including the segmentation of the market according to factors including geography, demographics, psychological and cognitive reasons, such as interests and activities, usage of products and the meanings and benefits of products
2. The environment of technological innovation, and the diffusion of innovations
3. The perspective of the individual, including perception, personality, motivation and learning
4. The social perspective, including attitudes, family influence, small group influence, class influence, and cultural influences

5. Consumer decision making process, including communication and information, persuasion, the decision making process, and the consequences of decisions
6. The development of the consumer and consumerism, including the historical development consumption and its future evolution in the context of technical and social change (based on (Statt, 1997))

Of particular relevance to this study is technical innovation and the *diffusion of innovations*[18]. Research in this area looks at characteristics of individuals and communities, social factors, such as personal influence and the adoption process and decision making but within the context of the introduction of new products and their diffusion through a social system over time, introducing the ideas of contagion, segmentation of market according to the time of adoption, and an analysis of the technology and how it is perceived by potential adopters. By studying the diffusion of innovations within a community, (Rogers, 1995)[19] highlights the social nature of adoption – how an individual adoption is only part of a broader community adopting. Rogers proposes a number of key issues of influence in the diffusion and adoption of innovation: the concept of innovation, its diffusion over time, personal influence and opinion leadership, the adoption process, the roles of the innovator and other adopter categories, and the role of the social system or market segment. Gatignon and Robertson add to this the importance of marketing or change agent actions, and the role of competitive actions (Gatignon and Robertson, 1985). Other work from consumer studies focuses on the lead up to, and moment of purchase of goods, building a model of the consumer, and their 'innovativeness' – characteristics such as opinion leadership and interpersonal information seeking which have been shown to have some correlation with innovation adoption – and building a 'consumer' model of new products. Rogers also points out how the innovation itself can be analysed to see how relevant and amenable to adoption and diffusion it may be, suggesting a number of important features to be consider in relating

it to the social system it enters: relative advantage, compatibility, complexity, trialability and observability (Rogers, 1995).

These factors provide inputs to the adoption process which takes into account attitudes and awareness about products (Cognitive processing), the uncertainty and risk of adoption (including financial risk, social risk, credibility risk etc), pre-existing activities that will influence and be affected by adoption, and finally competitive innovative solutions. For different products, consumer adoption studies try and discover what factors are salient in adoption (product attributes, personal innovativeness in relation to particular product categories), and crucially for market research, how attitudes towards a new product are related to actual intent to adopt. One of these models of influences in the adoption of innovation is proposed by (Gatignon and Robertson, 1985)[20]:

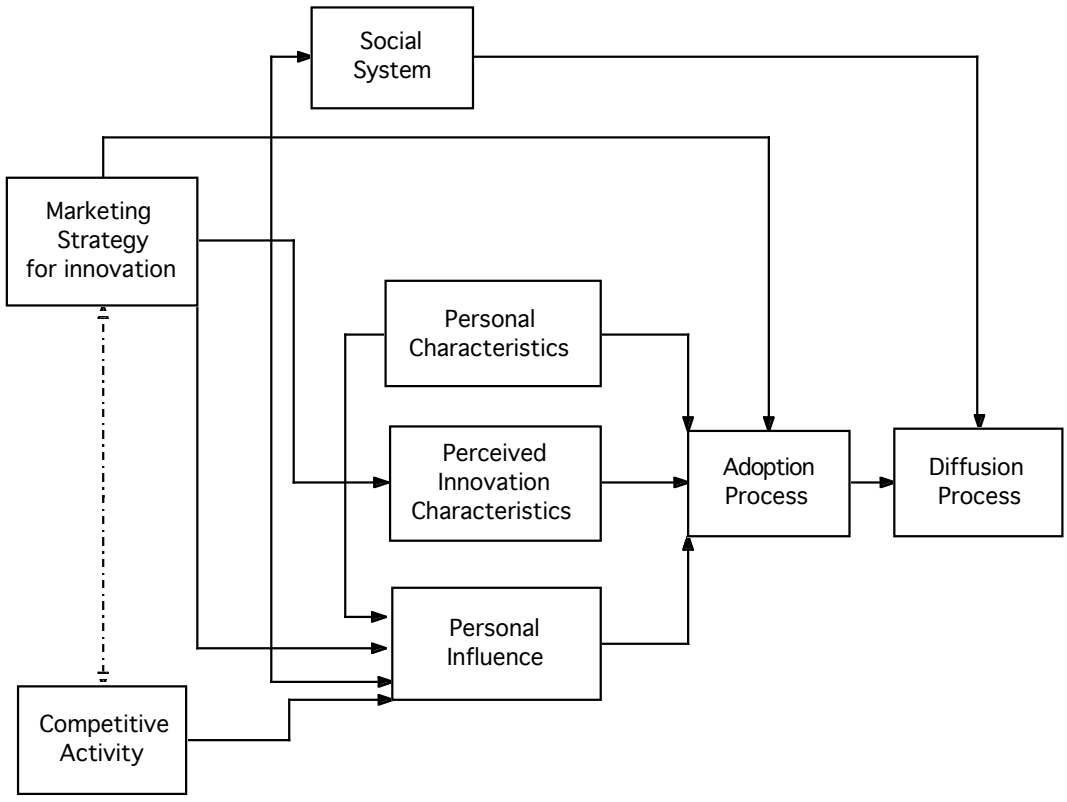


Figure 1 Factors in the diffusion of innovations (Gatignon and Robertson, 1985)

In this review of the literature I concentrate on the adoption process, personal influence, perceived innovation characteristics and to a lesser extent, personal characteristics.

2.4.1 The Adoption Process

The adoption process encompasses how an individual encounters an innovation, how he or she engages with it, how decisions are made about it, the process of actually obtaining the product and then its implementation and use. One model that is widely used is that developed by Rogers (Rogers, 1995). Rogers identifies a number of stages in adoption, taking the concept of adoption away from a simple decision to purchase towards a more complete model that accounts for the long awareness building and evaluation period that may occur before any actual purchase, including the possibility of trial and rejection, the importance of demonstration and recommendation, post-purchase re-evaluation and re-invention, and more creative consumer behaviour. Rogers' model contains five main dimensions to an innovation decision process (Rogers, 1995):

Knowledge – exposure to existence and understanding of function (questioning whether awareness comes through a search initiated by need, or through random exposure in the environment);

Persuasion – formation of attitude, often based on affective judgements, including thought experiments and getting *innovation-evaluation* information from the close social network ;

Decision – to adopt or reject – often based on personal or vicarious trials;

Implementation – putting to use – including the appropriation work needed to be done until an innovation is institutionalised. This stage can often include some *reinvention* of the product (Von Hippel and Finkelstein, 1978), innovation in its use or adaptation to new circumstances and conditions (Foxall, 1994);

Confirmation – reinforcement or disappointment – sometimes leading to discontinuance[21].

Studies suggest that the adoption of 'high involvement' innovations – risky, costly, or involving structural changes - can follow a these stages in a rather linear manner, but in general there is little longitudinal research that demonstrate how these processes work[22].

Different sources of information and confirmation are used during different stages of this process, specifically mass media, and local and 'cosmopolite' interpersonal sources[23]. The media and cosmopolite sources are used more by early adopters and in the knowledge stage, by those who have to go outside their group to find information, and maybe have outside groups as the reference and model for their own adoption. Rogers suggest that local sources, those of the close social group are referred to more in the persuasion stage as people form attitudes and make decisions.

There have been a number of criticisms of diffusion research. Rogers, who has done the most to consolidate and expand it has several criticisms of the type of research that is conducted in practice:

1. There is a lack of process orientation. Research tends to look at the moment of adoption, and not actually track the individual's decision process over time.
2. There is pro-innovation bias which assumes that all innovation is desirable (Dunphy and Herbig, 1995).
3. There is a lack of lack of socio-metric analysis[24].

My study is designed to address the first two concerns. (Dunphy and Herbig, 1995) make some further criticisms which will be addressed in more detail in the course of this chapter:

1. It is assumed that opinion leaders are innovators and they will lead the rest of consumers, when it seems that "most true innovators are likely to be social deviants, abnormal and adopt innovations indiscriminately" (Dunphy and Herbig, 1995, p.196) quoting (Sheth, 1981))

2. If the product is not used, the blame for failure is set on the individual, and their lack of intelligence, inability to change, rather than the product.

They also point out that the pro-innovation bias, while very common among innovation promoter is in fact completely absurd, since in fact most products fail because most innovations are not desirable, not to a small group of 'laggards' but to the majority of the "pragmatist" population.

Gatignon and Robertson also point out that most research has focused on single decision (Gatignon and Robertson, 1985). However for many ICTs, multiple units are adopted, and then subsequently upgraded or added to with extra services, software etc. The arrival of the Internet means that the user is able to adopt new and innovative services everyday based on the same technology. Research has also often focused on a specific innovation. We need to look at how and innovation fits into existing consumption system and inventory patterns, including competition for resources, and discontinuous patterns of adoption. To do this involves an integration of adoption theories with insights from studies of consumption.

2.5 Technology and Everyday Life

As discussion of adoption makes clear, consumption does not happen at the checkout. The purchase or acquisition is just one moment in a process of developing knowledge and attitudes and of practical use that we must contextualise within the world of everyday life. The environment for consumption of goods and artefacts is difficult to delineate. One category is 'everyday life', introduced as a concept by sociologists such as Lefebvre (Lefebvre, 1971) and Bourdieu (Bourdieu, 1979). Sørensen defines the everyday as the routine, non-specialised, non-bureaucratic: it is found everywhere (Sørensen and Berg, 1991). This is not ideal since much of the 'everyday' is still found in bureaucratic settings, but like much in this field there are shifting boundaries of definitions, not only from an analytical perspective, but because reality is changing as well. Gender studies has

been particularly keen to study the ‘everyday’, where everyday was the non-work area, the traditional women's realm. Of course this emphasises that the home *is* the site of work (Cockburn and Fürst-Dilic, 1994). This has been part of a process of focusing attention on realms of life that have been previously rather ignored.

In studying technology, especially with the social or cultural perspective, the everyday routine is very important. Technology is often seen as globalising, bureaucratising, standardising, but it is always appropriated and re-embedded in *local context* (Lie and Sorensen, 1997a). Technologies acquire meanings in everyday life. Here, old technologies may acquire new meanings, and new ones existing meanings. This is summed up as “Technology in everyday life is looking at it as a personal and familiar” (Sørensen and Berg, 1991). Of course every individual has their own everyday experiences. What is out of the ordinary for one person is completely everyday for another: one person’s special life-changing event can be perfectly banal in another context, so the analysis of everyday life has to stem not from pre-conceptions about what it should be, but from the experiences of individuals as they live their lives. We actually have to question whether ‘everyday life’ is in fact a good concept when we come to study the life of an individual which crosses all sorts of organisational boundaries and encompasses different regimes all in the course of the ‘everyday’. Later in this review the idea of the ‘life-space’ is introduced as a way of extending the concept of the everyday.

The discussion of the consumption of material goods (as opposed to media goods) and their place in our lives can be put in the context of the broader place of material goods in everyday life. A number of writers emphasise the important role that artefacts or technologies have in our everyday life experience, and how they serve important purposes in grounding that experience, and as the object of our everyday definition of self and our relationship to others and the rest of the world. Hannah Arendt (Arendt, 1958) suggested that quotidian artefacts serve to stabilise human life: they

provide practical and symbolic supports and continuity to our lives. Objects are used in the formation of our own identity, and in the way we interpret the world around us[25]. Hickman investigates what he calls the "Phenomenology of quotidian artefact", to show how people use technologies for self-stabilisation and to remove themselves from the real world, to the world of enchantment and imagination (Hickman, 1988)[26]. A particular example of a technology used in this way is the motorcar (Lamvik, 1996) (Barthes, 1957)[27].

This approach is very useful – it emphasises the meaning and uses of technologies that are not directly associated with their specific technical function and the practical activities for which they is used. It highlights many of the 'good' things about technologies, that some people find more than others do, an 'expressive' or 'play' relationship that is often overlooked. (McCracken, 1988) shows how consumer goods are given symbolic meanings by those who consume them, and how those meanings are developed, linked, maintained, developed and interpreted[28]. He highlights a number of symbolic actions or rituals that we use to maintain, enforce or transform the meanings we give to artefacts (McCracken, 1988). These include exchange rituals, especially gift giving, possession rituals, the activities of making goods our own, grooming rituals and disvestment rituals when we get rid of products or obtain second hand ones[29].

2.6 How we Consume

The types of analysis presented so far show something of the way we consume products that goes beyond their practical application. However, what are the sources of meaning and cultural difference attached to technology. Consumer research generally recognises three main dimensions to consumption: *Functional*, they do something practical; *Experiential*, they provide sensual pleasure, entertainment etc; and a third factor, *Identity*, which recognises that products provide expression of self identity of individuals and groups, and help provide links to an individual's past or a group's social history[30] (Csikszentmihayli and Rochberg-Halton 1981; Belk

1988; Wallendorf and Arnould 1988; Fournier 1991). Holt (1995) has extended this in an interesting interpretation, bringing together the various personal, social and cultural dimensions of consumption. Drawing on a study of supporters of a baseball team he suggests that there are four dimensions to consumption, based on the structure of the action and its purpose. Autotelic activities are those that 'justify the end in themselves', or are purely undertaken for their own sake. Instrumental activities are to produce other outcomes. Some consumption activities are focused on an object, in this case baseball, or in our case some aspect of an ICT, others focus on activities that are primarily social or interpersonal.

	Autotelic	Instrumental	
Object Action	EXPERIENCE	INTEGRATION	**STRUCTURE of ACTION**
Interpersonal	PLAY	CLASSIFICATION	
	PURPOSE OF ACTION		

Table 1 Four dimensions of consumption (Holt 1995)

Here I apply these categories to the consumption of ICTs.

Subjective reaction/experience*: The direct, (phenomenological) experience of the object:* exciting, fascinating, brilliant, wonderful, troublesome, frustrating, feelings of helplessness, bafflement.

Integration: *Actions directed at the object.* These include: Assimilating: becoming a computer person, owning, learning about device and uses; Producing: the technology is useful, indispensable, it gets the job done, it makes a particular lifestyle possible, or makes work possible; Personalising (appropriation): both *physical and meaningful* including owning, (e.g. a collection of software, games, e-mail addresses photos, IT hardware), developing one's own knowledge, production outputs, and demonstrations of successful personal use.

Classification: *social classification of individual*. Based on Object: ownership, knowledge, expertise, (Mac person, technology person, graphics person, nerd, or alternatively, a non-technology person, resistor, left behind, excluded); or Based on Action with Knowledge/object*:* professional user or amateur enthusiast, innovator, entrepreneur, games expert, programming expert; activities such as reading about, spending time using; or classification through actions towards others: active proselytism, teaching, talking about, boring…

Playing: *autotelic (having no other reason but itself) interpersonal relationships.* As a common experience: playing together, working together, designing together, communicating; Socialising: as a conversation point, a focus for relationship building: shared interests, talking about, swapping, helping and teaching

This type of analysis can also be applied to non-adoption of artefacts (as we shall see later), and seen in the context of processual analysis of adoption or domestication. For example these consumption processes can be seen in all stages of the adoption process, and in the appropriation and on-going use of the product or service (see Appendix). We can see what a technology means in someone's life, it lets us understand how and why it is used, particularly for consumption as social identity[31].

We can see this type of analysis applied in the case of the home computer (Aune, 1996). Computer users can be classified as ideal types: the *Overtimer,* who uses the computer in an instrumental way to bring work home, but is not interested in it otherwise; the *Explorer*, for whom the computer crosses over home and work, and which use of the computer is just another extension of passionate interests in work or hobbies that dominate other activities. Engagement with the machine is an important reflection of self identity; The game player who used the machine as a *time killer,* just as a way of spending some leisure time, but would be just as happy (or happier[32]) doing something else; and the *game freak*, for whom

gaming is a way of life, with the social consumption of games as important as playing them, with self identity as a game player.

	INSTRUMENTAL	EXPRESSIVE
Work	overtimer	explorer
Leisure (Hobby)	time killer	game freak

Table 1 Ideal types of home computer users from (Aune, 1996)

This brings out two dimensions in the use of ICTs: the *expressive* and the *instrumental*. Research on use of ICTs has often noted this type of division of interpretation of a technology: with some people focusing on the technology as a tool for achieving ends, and others integrating the technology much more with their self identity, and using it as a way of expressing that identity, in the same way other might do with, say, a sports team. We are essentially contrasting the utility of a product and the engagement it produces. *Utility* is what we find useful in a product, in use; *engagement* is the way our imagination and interest are captured by a product, whether it is a new computer or a novel [33]. These two factors are key to the way we appropriate and use all products: utility is linked to the practical benefits and problems we identify in a product, and the engagement is our subjective response to it, how much is excites us, provides us with comfort or opportunity to play (Hickman, 1988). To investigate personal and social meaning of technologies further, we need to look more closely and the qualities of technologies, in particular ICTs and at examples of how people consume them at a symbolic as well as a practical level.

2.7 The Qualities of Technologies

In studying the adoption and use of new ICTs we must address the issues of whether they have any particular characteristics that distinguish them from other types of innovations or established products that could make a difference to the say they are adopted and domesticated. There are several ways to look at products, and particularly new technologies. While a pure deterministic viewpoint still exists, with the technical functions and facilities of

a product being the basis for all analysis, most researchers have tried to develop more sophisticated approaches. These are generally based on an analysis of the particular technology in relation to the potential user existing technologies and other new technologies, and the development of complementary socio-technical systems. New ICTs are often suggested to have a number of characteristics – they are radically new products, and often involve a great deal of investment in products and learning.

The notion of radical or discontinuous innovation (Freeman, 1988) suggests that an innovation is very different from what came before, and generally, considerable innovation is necessary in the system in which it will be adopted, and in the creation of new meanings. This type of argument covers technical, economic and symbolic dimension of technology. Many ICTs appear to be radical in some sense, either because they are used as part of radical organisational change, they demand people to make significant changes in their lives, or give people significant new opportunities. Sometimes however the change is not so radical in practice as it is in theory. Often technologies offer the possibilities of change that are in fact very slow to develop as they are implemented. Sometimes change can be very subtle, as in the case of the Diderot effect (McCracken, 1988) discussed in section 2.8.1.

Within the field of diffusion of innovation research, Rogers (Rogers, 1995) tries to examine in detail the different aspects of a new technology and how they are is perceived by potential adopters. He suggests five perceived attributes of an innovation that will be crucial to its potential for diffusion: Relative advantage; Compatability, Complexity, Observability; Trialability[34]. These factors he rather unconvincingly suggests can explain 49-87 % of variation in rate of adoption of different products. The rest is explained by other factors such as the social network and the role of change agents. Rogers give examples of the mobile phone and video games machine as being products that satisfied all criteria for adoption, although it is obvious that this only applies to a part of the market to which the product appeals.

This approach is one that is meant to be a tool for analysts and promoters to use to understand how and why a technology has been successful or not in the market. It does not tell us how a particular technology will actually be judged, and the meanings that will be attached to it and how that meaning will evolve. However others have analysed how technologies are given meanings, and how the technologies not only fit into technical systems and activities, but also how they fit into existing networks of symbolic codes, for example the classification of domestic technologies suggested by (Livingstone, 1992), of the system of meaning-based relationship between consumers and products suggested by (Fournier, 1991) such as Objects of Utility, Ritual Enhancers and Objects of Personal identity[35].

Some products have a high symbolic content, and therefore will provoke more contention that those with low symbolic content (Hirschman, 1980). Many ICTs are supposed to be high in symbolism, reflecting their demands on the user, their cost and skills needed, the problems they cause and their association with particular user groups and activities. They require the consumer to be engaged to quite a high to degree with the adoption process, sometimes called 'high cognitive processing'[36]. These types of products require high consumer learning, especially for discontinuous innovations. They also often require high innovation and switching costs (Gatignon and Robertson, 1985). In some cases they are dependent on social acceptance, and can be symbolically defined by social referents (Hirschman 1981).

Products with high symbolic content are also much more likely carry a range of different interpretations. Since many ICTs are often adopted by a multi-person adoption unit, such as a household, this creates much more room for dissent or conflict, and a more complex domestication process. At the time of this study (1987-88) little research focused on the whole household, or recognised the multiple types of households today. This makes the analysis of the adoption process much more than simply following an individual making a rational decision about their needs and the technical or other merits

of an innovation. Instead an approach sensitive to the issues raise by the 'domestication' research is necessary.

2.8 The Domestic and Domestic Technology

One of the central locations of everyday life, especially in the definition opposed to the workplace, is the domestic setting, the home or household. This is the focus of much consumer and consumption research. The home has become a key location for the use and ownership of artefacts during the 20th Century, and new ICTs are expected by many to make our lives even more 'home-centred' (Castells, 1996 , p.398). Much of industry has developed to create products that create or satisfy the demand of labour saving, leisure and now professional work tools for the domestic environment (Forty, 1986). Through this process the home has been transformed, physically and culturally within itself, but has also become an important 'consumption junction' (Cowan, 1987), the focus of an entire network of external social actors[37]. It is clear we need to describe and analyse the household before we can understand the place of technology in the home, and its interactions with the broader socio-technical network.

The family, which has come to be regarded as the typical social unit within the physical home has "dynamics that are expressed and managed though shared goal, family myths, rule and routines, conflicts and tensions and its frameworks for explanation and understanding." (Livingstone, 1992, p.113). However, while the household[38] is often a family home, there are an increasing number of other possibilities, and the family itself can vary greatly in integration and extension (Livingstone and Bovill, 1999), particularly over the lifecycle[39]. Many people live in some other sort of household. Whatever its composition, home is certainly 'gendered', and constructed spatially and temporally (e.g. (Giddens, 1991)). Our study is then one of the socio-technical dynamic of domestic setting: the social dynamics of gender, power relations, distributive patterns, institutionalisation, symbolic relationships, and

relationship between political, social, economic issues of everyday life. (Sørensen and Berg, 1991; Morley, 1992; Silverstone, 1994).

Silverstone, Hirsch and Morley attempt to capture way the household works with the concept of the *moral economy*: "it is an *economic* unit, consuming, producing, exchanging. It is also a *moral* economy, because these activities are defined and informed by cognition, evaluations, aesthetics, themselves defined by histories, biographies and politics of the household and its members" (Silverstone, Hirsch et al., 1992)[40]. Households will share some of these features with the public world, but will also have their own distinct and evolving character within a boundary that is physical and cultural but is constantly called into question by technologies and household members (Morley, 1992). Work in family sociology looks at how the family deals with major life events, and the use of goods and space in the home (Anderson, Tunalay et al., 2000). Consumer research has also attempted to examine these family dynamics in the consumption of goods and services. The family and the household socialise us into consumption, and the family unit, of whatever form, is an important consumption unit as a whole. Consumer research highlights the social processes and the appropriation work that occurs even before the product is introduced in the home (Statt, 1997) such strategies using in the negotiations over adoption, and roles that different household members play in the consumer life of the home[41].

To illustrate this, recent work on the place and use of ICTs within the home by (Livingstone and Bovill, 1999) looks at the role media technologies play in family life, the gender differences in use and interest, and the development of a youth bedroom culture of media use[42]. As an example of the range of ways that ICTs are integrated into family life, the researchers tentatively identify a range of styles of family interaction, based on how families divide their time between shared and individual activities. They highlight life-cycle changes in the way that families use media, and note a key dimension is whether families live 'together separately' and use media according to their own

lifestyles, or families that live a convergent lifestyle, and consume media within shared activities[43].

The important point to draw out is that we are trying to open the black box of the household. To analyse patterns of consumption, adoption and resistance to new technologies we must not stop at the boundary of the household, representing it as a unity. We have to look inside, to the individuals living together, who have different expectations, reactions, power and knowledge, constantly changing and re-enforced. Equally, it is important not to treat the 'domestic' as sealed from the outside either. This is starting to become the concern of some researchers, as more and more examples of the home and workplace overlapping are recognised, especially with the adoption of new ICTs. Evidence and arguments for this crossover and types of boundaries between spheres or arenas of everyday life is examined shortly[44]. As we study the boundaries of the home, we start to see how they too are constructs, and have to be constantly maintained: "Acts of boundary marking are of crucial importance for the on-going creation and experience of the home" (Moores, 1996, p.48). Some people have a home that is very open to other people, to bringing in work, to the public view; it is one physical space that is linked to other people's houses, the street and the workplace. Others defend their home as a very private space, not wishing to let anyone know what is going on outside. The home is one place that one can really be 'oneself', where one makes the rules and does not have to bend to the wishes of other. Therefore we have to look at the home in the context of control and confidence of its residents not only in their house, but also in other areas of their lives.

2.8.1 The Domestication Model

Using in-depth studies of ICT use in different sorts of households[45] (Silverstone, Hirsch et al., 1992) developed a well-known framework, Domestication, to help understand the nature of private household and public worlds and the role of communications and information technology in that relationship. They see technology as a way to study household relationships,

and use a model of relationships to study how technology is used, the *moral economy* discussed previously. Domestication is a tool to allow the researcher to follow the process of cultural integration of artefacts from the outside world into the home without losing sight of the physical artefacts (Berg, 1996). (Silverstone, Hirsch et al., 1992) suggest domestication comprises four elements of symbolic and cultural work: *appropriation* (the technology is brought into the home), *objectification* (the way the object is fitted into the space and time structure of the home), *incorporation* (the everyday usage) and *conversion* (fitting the object to the wider social and cultural surroundings)[46]. These are not discrete, but inter-linked facets of the biography of a domestic technology and the home. Although these processes would appear to relate primarily to the initial adoption of a product, they continue as use, the household and technology change. Looking back to the McCracken's rituals, we can see exchange and gift giving as one of the stages of appropriation. Rituals of possession and grooming can be seen in the on-going process of domestication, as products are constantly reassessed[47]. McCracken also points out that as new products are introduced into the home they are not only integrated into it, but change it. He describes the concept of Diderot Unities and the Diderot Effect[48], whereby every new introduction into the home sets off a re-evaluation of the existing material environment in a never-ending spiral.

Another approach to this two-way process suggested by Fournier and Deighton (1999), focuses on *assimilation*, where on the one hand we accommodate ourselves to the artefact, making up for inconveniences or shortcomings, and *incorporation* of new product and person meanings. They point out that any new assimilation also involves the successful *dis-adoption* of existing way of doing things, routines, relationship patterns etc. This is often the end story for many products, a process of disvestment (McCracken, 1988) as artefacts can become worn out, are disposed of, or owners lose interest, but often involves active rituals of dispossession, such as mourning or pleasure at seeing the back of the old.

Other researchers have taken up the ideas of domestication as a general approach to analysing the appropriation of a generic technology to a specific setting, whether it be the home, an organisation or even a country. Lie and Sørensen edit a book of research that uses the concept as a tool and inspiration for more research on contemporary ICTs, notably the home computer (Lie and Sorensen, 1997a). They use domestication to emphasise the practical and symbolic work that is done in appropriating technologies in many situations. As appropriation occurs, local routines are constructed, and general scripts (Akrich, 1992) or ways of doing things are transformed as the technology creates new opportunities, but also imposes itself on the existing organisation. There is a two-way process of enabling and disabling, done on the one hand by the strategies of designers and marketers trying to shape and promote certain uses and meanings (Woolgar, 1991), and the counter strategies of users appropriating and redefining the technology both in relationship to the technology, and between each other. Domestication does not imply taming, but rather "stable truces that can be broken" (Lie and Sorensen, 1997b): re-domestication can and often does occur (e.g. telephone, screen activities).

2.8.2 Domestication: the Home and the Country

Historical research on technology and design illustrates how technology comes into everyday life of individuals and a nation. This approach integrates the model of domestication at the household level with domestication at the level of broader cultural groups – particularly a country. The domestication process contributes to a social shaping (Williams and Edge, 1996) or social constructivist (Bijker, Hughes et al., 1987) analysis of the history of a technology. My study looks at the evolution of a modern generation of ICTs, in particular, technologies of the mass market, the Internet, the mobile telephone and personal computers of various sorts. In the past other ICTs have had huge influences on society, and it is very informative to look at the telephone (Fischer, 1988; Moyal, 1992; Umble, 1992; Frissen, 1994; Flichy, 1995; De Sola Pool, 1997) or the radio (Forty, 1986; Moores, 1995; Crisell,

1997)[49], and other less successful media technologies such as videotex (Schneider, 1991; Bouwman and Christoffersen, 1992; Bouwman, Christoffersen et al., 1992; Feenberg, 1992; Thomas, Vedel et al., 1992). These histories tell a story of initial technical innovation, and a 'DIY' culture of enthusiasts competing with an alternative commercial interpretation of the technology and its use. Eventually there is a degree of stabilisation as commercial or monopoly providers are able to implement more advanced and diverse technologies to satisfy a mass market that includes a huge variety of individual and corporate users with very different uses for the technology.

The examples of the telephone and the radio illustrate technologies that were deployed in commercial and domestic markets, simultaneously, at a formative stage in their development. However, while broadcast radio tend to be used by only a minority in both the office and at home, the telephone is used by many in both places[50]. In particular, the telephone system was used in commerce and then appropriated by consumers for their rather different uses. The same is now being seen with the personal computer, the mobile phone and the Internet, where almost exactly the same systems are in use in the two domains, and remote systems are accessible from both domains, and are often designed to link them (e.g. consumer e-commerce). Other technologies, such as interactive television, although they use rather similar underlying techniques, have been developed in a rather different way for the consumer and business markets. In the case of the Internet the cross-over is not so straightforward as with the telephone, as many would say that there is a two-fold appropriation of the original system away from the academic and military users to both commercial users and the general public. From the point of view of constructivist analysis, its development can be seen as the conflict over interpretations of what the Internet is and should be (although this is a debate for another day!).

2.9 Interpreting Domestic Technologies

What are the symbolic values that people ascribe to technologies, and how does this affect the way they engage with them. Sonia Livingstone examines the meaning of domestic technologies using a personal construct approach which focuses on the way people actively construct their world (Livingstone, 1992). This highlights some of the ways that technologies are incorporated into the household and become points of conflict, especially as men and women give very different meanings to everyday technologies. She identifies four main ways that people will feel about a technology: Technologies are *Necessary,* and cannot be done without[51]*;* they allow *Control* over things, time, one's own life and other people; they are *Functional* – they do things, both practical and impractical; and they facilitate *Sociality* and *Privacy*[52]. The different meanings associated with technologies reveal some of the tensions in the family, and their different values, such as decisions on what money should be spent on or how much time tasks should take. We can imagine, and there is evidence for, conflict over newer technologies - such as the CD, VCR, Satellite TV, a multimedia computer - often men's and children's toys. For example, in a study of women and domestic technology (Gray, 1992), Gray found that women had very ambivalent attitudes towards the video recorder and other entertainment technologies in their family households. Women had little role in buying the machines or in renting tapes. Some women felt they were inadequate to operate the machines. Others were very happy to let their men-folk operate them, as they knew that would keep them happy. Some deliberately refused to learn to use the video, a strategy of 'calculated ignorance' to make sure that recording programmes did not become yet another domestic task they would be expected to do[53]. The idea of differential control over technology in the home was also picked up by Susan Fournier and David Glen Mick in a study of the appropriation of answering machines (Mick and Fournier, 1995)[54], where the machine is used to emphasise the power of particular household members.

While all artefacts and technologies introduced into the home are important, ICTs are among the most interesting because they are “not just objects, but media”, “as media, they provide actively interactively, or passively, links between households, and individual members of households, with the world beyond their front door... in complex and often contradictory ways... they are doubly articulated into public and private cultures.” (Silverstone, Hirsch et al., 1992). One consumes the technical artefact, and also the services, information and entertainment mediated through it. These ICTs include television, as contemporarily the leading ICT (Silverstone, 1994)[55], radio, the telephone and mobile phone, the personal networked computer (certainly in contention as the new ‘leading ICT’), video games, Videotex system, such as Minitel and teletext, Internet, video recorders, interactive television etc. As media, especially television, they have attracted the attention of a range of scholars and commercial interests, interested in the ‘content’ or the messages delivered by the media, and they are the focus of a range of theoretical and empirical work that is complementary to studies of technology: media studies, cultural studies, gender studies (Wand, 1968; Hall, Hobson et al., 1980; Greenfield, 1984; Morley, 1986; Lull, 1990; Williams, 1990 (first pub. 1975); D'Agostino and Tafler, 1995; Moores, 1996; Winston, 1996; Östlund, 1998; Livingstone and Bovill, 1999). Much of this work has been focused on power and semiotic readings, used in both a deterministic and constructivist way (McLuhan, 1964; Hall, Hobson et al., 1980; Morley, 1992).

Studies of television also highlight cultural differences over the acceptance and use of technology[56]. Just as there are foods that are good for you and ones that are pleasant (Charles and Kerr, 1988), so there would appear to be technologies that are good for you and ones that are not? Research on technologies at home shows that domestic media technologies are often disputed as to their value (Silverstone, 1989; Silverstone, Hirsch et al., 1992; Moores, 1995). In particular, the ‘middle-class’ opinion that television is somehow bad or to be limited in it use, especially by children. Silverstone

and Baudrillard both consider the different class relationships to television (Baudrillard, 1981; Silverstone, 1994, p. 123). Baudrillard based his analysis on consumption of the TV in the late 1960s, when lower-middle class households attached status value to the technology, and upper-middle class owned for the use value. Later work by Moores saw that satellite TV (Moores, 1996) had a very different image in the 1980s – indicating low status, or at least unacceptable status in the upper-middle class. However these have to be seen in historical context. We can also look at early meanings for the video in Norway (as a device for playing pornography), and in post-soviet Russia, (a device for educating children in western culture).

However the introduction of new technologies into the home has meant they have had to be re-evaluated, some as being 'bad', some as 'good for you'. For example among a certain percentage of the population there is the assumption is that 'Media' is only good for you when it is informative and educative, or engages with 'elite' culture, (which of course it can only do badly). Entertainment and popular culture are merely a waste of time, and actually dangerous because they distract from more worthy activities – learning, face-to-face relationships, being outdoors, reading etc[57]. Multichannel Satellite and cable TV has suffered criticism by many as being 'bad' – as if 4 or 5 channels is not bad enough, why would anyone want to waste time on 30 channels?[58] The computer has often been seen as a 'good' thing (Livingstone and Bovill, 1999), the Internet too, and both have been sold, and are bought, as important educational devices for the home[59]. However, like the home computer in the 1980s, both can diverted to less acceptable activities, principally games[60]. Within the discourse around the Internet there is a re-evaluation of the media in general, and the Internet is sold as a 'better' technology or medium than the television. Active use and interactivity of the Internet and the computer are contrasted favourably with the 'passive' nature of broadcast media. Computer games occupy a strange niche – they are 'better' than much TV – they demand active engagement, and some can be edutainment. However they are certainly seen by many as

a waste of time, and addictive, both negative features if other activities are to be encouraged. Within video games there are of course differences as well e.g. killing games v. construction games (Greenfield, 1984; Mediascope, 1999b). In these arguments and meanings there appears to be a focus on 'knowledge' as an important value, set against entertainment. Products that build knowledge in some way, and encourage active engagement with the world and with information are better. However many people recognise the qualities of the TV as an aid to relaxation. Its ability to engage one with the minimum personal effort is a quality that is useful, but should be controlled.

Summarising the lessons from cultural studies of consumption and domestication, the user is taken as active in appropriating the technology, there is conflict over practical and symbolic aspects of, and media and communications technologies have meanings both as physical objects and through the content and messages conveyed through them. Domestication puts into question the boundary and relationship between where are technology comes from, and where it is used, and the various domains where it is given meaning.

2.10 Spaces of Everyday Life: Home, Work and Boundaries

Although most of the research on consumption has focused on the home and domestic setting, certain technologies are in the home and in the workplace, and their adoption and use are closely linked in both domains. The workplace itself, and other locations, particularly public locations such as community centres, cafes, museums (Stewart, 2000a) are locations where we encounter and use new ICTs. While the workplace has long been the focus for studies of ICT adoption and use there is little that links these domains. U.S. researchers in the consumption of ICTs questioned this[61]. (Dholakia, Mundorf et al., 1996a) criticises the majority of ICT research for concentrating on the business applications, and for its technological determinist position, and call for an analysis based on understanding the everyday life of the consumer or user. In the industrial era they claim the *life-space* was demarcated into

categories of work and personal life, but this is now changing. Also changing are the activities we can do inside and outside of the home or workplace. Traditionally, technologies were divided clearly along the divisions of everyday life – radio and TV for private use in the home, industrial equipment at work, and a third set of activities and services in the 'transactional' sphere between work and the home – shopping, banking, insurance taxes, voting etc. They suggest we must now look for the ways that new generations of ICTs are integrating these spheres of the life-space (Figure 2). In particular, we see computers in the home for personal activities. Work is also entering the home with the computer, and many new 'tele' transaction applications can now be based in the home and at work. They point out that "once a technological system gets established in one life sphere, it has the potential to migrate to the other connected spheres" (Dholakia, Mundorf et al., 1996a, p.8).

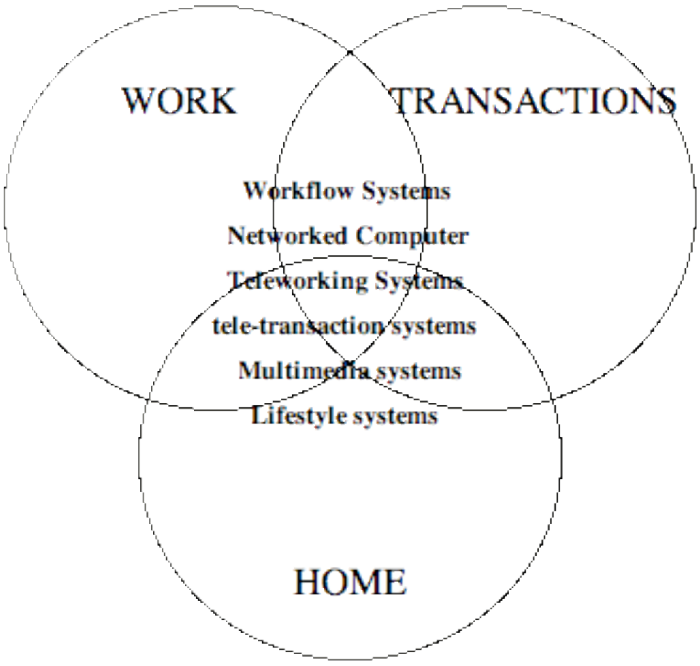


Figure 2 Integration of life space and convergent technologies (Dholakia, Mundorf *et al.,* 1996a, p.8)

This discussion of 'spheres' of everyday life demarcated by boundaries needs some investigation, especially if we wish to see whether new ICTs actually migrate from one sphere to the other, as they seem to be doing, and

whether there will be more integration of life-spheres as a result. The whole area of telework, and the rise of 'flexible' working based on new ICTs puts these boundaries into question (Qvortrup, 1999). Research in this area shows that the division between home and work is very variable, mostly dependent on the employment situation of an individual, but also based on their ability and desire to do 'boundary work'. Nippert Eng suggests that people are given different amounts of discretion by their workplace and family to integrate or segregate their life spheres as they wish, i.e. to define their own boundaries (Nippert-Eng, 1995). Individuals also have different ideas about how they want to segregate or integrate their lives. However this is not fixed: the home/work boundary is also subject to conflict compromise and change.

Boundaries are maintained and signalled by various markers and strategies, including time boundaries, space, objects, relationships, communications and activities of one sphere being conducted in the other sphere (Nippert-Eng, 1995)[62]. ICTs are used in boundary work in many ways: The workplace can use the personal computer to enter the home sphere, by giving a computer to do work at home, which many surveys show is one of the main reasons people have a computer at home. Nippert-Eng found that privacy in the workplace was necessary for managing boundaries, with technologies such as the telephone, voice mail and e-mail enabling people to maintain their boundaries as they wished.

Other important evidence about the use of ICTs in boundary work is provided by Gournay and Mercier, (1998). They examined the use of telecommunications in a study of the various forms of destabilisation of everyday life, and the practices and strategies used to cope with them (Gournay and Mercier, 1998), in particular, how people use the instruments of communication in order to control their space and time. Expertise and experience with technologies such as the phone at work increases the likelihood of adopting at home. The same is true of the computer. However with continuing maturity of the medium, the expansion of phone use at work

no longer has the same effect, it has the opposite effect – they found people using communication technologies in order not to communicate at home. Just as Nippert Eng suggests, the private or home space is divided from work space in a number of dimensions: spatial, temporal and relational. There is also an 'instrumental' or technical division with distinct domestic and company markets for new technologies. There are important differences in how people use the phone - over the life course, and depending on the type of profession they conduct, and how much they integrate their work into the rest of their lives. For example some people try to avoid the telephone at home as it represents the workplace, others were more integrative, bringing work home and using the phone to communicate and using the phone at work to manage their home life[63].

We have reviewed ideas about the adoption and domestication of technologies within the home, where the home is seen as a social space as much as a physical space, and discussed the importance of taking a broader view of everyday life introducing the idea of the life space. The home and the workplace are embedded in broader communities, and social networks link these, as many people divide their lives between different spaces. We can therefore change focus here to look more closely at the concepts of community and social network, and see how they can be related to the adoption and domestication of new ICTS.

2.11 Social Network and the Personal Community

Social research on technology emphasises the place that technologies have in a community: the idea of 'sociotechnical' is developed, where technical change is intimately linked to social change, and the use of technologies 'non-human actors' can only be understood in the context of social relationships of 'human' actors', their goals, knowledge, and power etc (Latour, 1987). Within organisations, the adoption and use of new technologies is examined in the context of the organisational structure, power

relations, explicit and tacit rules, departmental interests and agendas and knowledge flows. New technology implementation often creates conflict as it demands changes in organisation, established activities, and reinforces or undermines autonomy and power relationships. This can extended to socio-technical change across industry and government too. Recent innovations in ICTs have brought the phrase ‘paradigm shift’ out of the obscurity of science and technology studies (Kuhn, 1970; Dosi, 1982) into the jargon of management consultants and advertisers predicting the demise of ‘old economy’ businesses that do not reinvent themselves around the Internet.

Within the domestic sphere, the same type of analysis has been conducted on media and technology as we have seen earlier. The home is just as much as a socio-technical organisation as a multinational business. There are explicit and tacit rules, division of labour, power relationships, processes of exchange of money, favours and knowledge in the ‘moral economy’ (Silverstone, Hirsch et al., 1992). Conflict between generations, gender inequalities and vested interests, give rise to disputes over adoption and use of new technology. Wherever new technology is adopted, the appropriation process can be followed through the interactions of the household members.

As well as internal change in appropriation, the relationship with external *change agents* and other organisations is important for industry and the household. Change agents - those promoting the adoption of new technologies, whether they are advertisers or management consultants - have a powerful effect on the organisation, often having influence on particular parts of the organisation. Firms and families alike are also influenced by similar organisations, and are soucieux of how they are seen by others. The analysis of the network of human and technical ‘actors’ has been developed in different ways within technology studies to investigate the development, diffusion and use of technology (Bijker, Hughes et al., 1987; Callon, 1991; Bijker and Law, 1992; Law and Hassard, 1999).

While much of social science concentrated on a macro sociology of ‘institutions’, a branch of sociology has studied the ‘micro’ level of social

interactions, and particularly personal influence in the social network. Social Network Theory developed as a way of linking this micro-sociology to macro-sociology (Granovetter, 1973), and has become extremely popular as a way of analysing social phenomena[64]. Much of the stimulus for this approach has come from studies of social influence and the diffusion of ideas and innovations in a social network[65]. Most studies of why people adopted innovations have revealed that word-of-mouth influence and demonstration effects by others in a community are among the most important influences in adoption.

A number of concepts have been developed in social network research: the number and type of relationships an individual has in a community, the density of ties in a network, the type of influence that a relationship carries for the individual, the emergence of cliques, and ideas of centrality and periphery, such as those individuals who have a special role as sources of knowledge, and personal influence (opinion leaders), or those who are marginal in a network (on the 'edge'). Network analysis has been developed to analyse relational data about a community (Scott, 1991), and it is used to inform all aspects of social research as this is the basis of social interaction within a community.

2.11.1 The Use of Community and the Social Network

Some recent research on social networks reveals the different sorts of network that people have, and the way they use them (Litwin, 1996; Gottlieb, 1981; Wellman, 1982). Different classifications of network are suggested, based on variables of size and complexity, and factors such as availability of close kin, level of family, friends and neighbours involvement and the degree of interaction with community and voluntary groups. The social network provides emotional support and practical resources, but is neither symmetrical in its function nor made up entirely of people who get on with each other (Wellman, 1982)[66]. Wellman suggests a number of roles for the network, as: *"Havens:* a sense of being wanted and belonging, and readily available companionship… *Band-Aids:* emotional aid and small

services…*ladders* to change their situations… and *levers* … to change the world" (Wellman, Carrington et al., 1988). This emphasises how different people provide these services, and relationships are by no means equal or interchangeable. Most people have a small number of the informal bonds which they draw on to deal with life's contingencies[67]. The type of network and relationships we have, as with the more narrow interpretation of friendship, is shaped by gender, class, occupation, life stage, obligations, etc. Seen from the outside of course these network communities are experienced in very different ways by their members.

There have been many studies of the diffusion of innovations that have investigated the role of the social network in adoption, including ICTs[68]. The social network is of course the basis of the 'network effect' found crucial to the uptake of communications technologies[69]. Research on adoption home computers highlights the importance of social networks for providing practical and moral support in the adoption and use of new ICTs. In the 1980s Murdoch *et al* did a study of the adoption and use of home computers (Sinclair ZX 81s) in a town in the UK. The computer was not straightforward to use – it meant spending hours typing in programs by hand and trying to debug them. It was very tempting to give up with the thing. The researchers found that those who lived in more affluent areas where more people had bought machines were able to share problems, and support each other in discovering new uses, sharing experiences etc., than those in poorer areas where owners were isolated. (Murdock, Hartman et al., 1992). This role for the support network is an important research focus of this investigation. Another study in the US at a slightly earlier time also highlighted the role of the local social network. In a study of adoption of home PCs in the early eighties among professionals in Silicon Valley (Rogers, 1985), Rogers found that the principal factor in the adoption and diffusion of these early home PCs was the evangelistic work of experienced users within their social network. The PC at that time was very difficult to use, and personal persuasion and

help from friends was necessary to get people through the early stages of use.

2.11.2 Personal Influence and Word-of-Mouth

This thesis examines where and how people find out about new ICTs, what influences them to adopt or resist, and the social aspects of domestication of ICTs. How does the personal network or community influence our knowledge about and adoption of innovations? There are two main strands to the study of social and cultural influence on the individual consumer – one is from social psychology and the other is from social network research in sociology and innovation studies already introduced. The influence of social psychology includes using the model of Primary groups and Reference Groups (Chisnall, 1985; Statt, 1997). The attitudes, opinion and behaviours of an individual can be analysed by understanding the influence of their Primary or membership groups, or how they follow the lead of others[70]. This compares the influence of a person's close community, that of others visible in the broader social network, and finally groups or individuals visible in the media. The other relevant research looks at the mechanisms and importance of influence and information seeking or personal influence (PI). Personal influence has two dimensions: that of personal contacts - word-of-mouth (WOM) – and comparisons with others in a structured society.

Word-of-month influence has been highlighted by many studying the diffusion of innovations from the 1950s onwards, who have found a 'vast and powerful network' of neighbours exchanging product information ((Whyte, 1954)[71]. Pre- and post- purchase communication by consumers about products is now recognised as a key aspect of successful marketing of innovations (Swan and Oliver, 1989). However, what sort of relationships are most important in personal influence and WOM, and how do they work?

There are two issues, one related to access to or obtaining particular information, the other to influence in resolving uncertainties, and shaping attitudes and behaviour. Sociology has shown the importance of 'weak ties'

in providing access to new information (Granovetter, 1973)[72]. However social psychology suggests that informal groups are essential for resolving issues of uncertainty (Festinger, Schachter et al., 1959), such as those involved in adopting novel products, so close relationships would appear to be important[73]. Granovetter also recognises the value of strong ties – and suggests ways they are used for particular network-based activities, such as information seeking, referral, and influence. For example, he suggests that strong ties are more likely to be activated in referral than weak ties. They are also more likely to be used for information seeking because in these relationships we are more likely to know that the other person knows. It would also seem likely that similar strong ties are activated for advice on similar products, as we know that those people can help, and have advised before. Rogers suggests that in certain circumstances strong ties may be more credible than weak ties, so that their influence will be stronger (Rogers, 1995).

Along with the concept of tie strength, some researchers use homophily and heterophily[74] to describe the type of structural relationship between people. Homophily is when pairs of individuals are similar in terms of certain attributes such as age, education, sex, social status (Rogers, 1995). People interact with those similar to them ((Laumann, 1966) quoted in (Johnson Brown and Reingen, 1987)). By this argument heterophilous relationships should be less common and weaker[75]. It would seem apparent that while people in a network may share common attributes, they can also been very different, such as between generations in a family, or in a workplace. It seems very likely that we associate closely, if not voluntarily, with many who are not similar to us, just as we do not know many who are like ourselves.

In 1983 Rogers lamented the lack of socio-metric analyses[76] could understand exactly how personal influence and word of month influence in the social network actually worked, as no-one had attempted to track the flow of information in interpersonal ties, weak or strong. (Johnson Brown and Reingen, 1987) are among those (including this study) who have tried to

address this issue, using the insights and tools from social network research, looking at negative word-of-mouth and feedback loops in a community by following who-told-who information flow networks[77]. Weak ties do seem to be important bridges between subgroups, linking micro to macro level in the community. However, strong ties were more important at the level of individual contacts[78]. It would appear obvious that where information is already known by someone in close proximity then these strong ties are used in preference to the greater effort, and in required to look outside, They suggest that strong ties are induced by situational and environmental factors– as topics arise in everyday conversation (spatial and structural proximity gives rise to relational proximity).

This study also raises a number of methodological points for studying WOM and social networks. Rather than looking at closed networks, it is important to study the role of WOM in an *open community,* representative of real consumer situations, unlike many of the other closed studies. Given the importance of weak ties and bringing information between close social networks, (e.g., between groups of work colleagues and neighbourhood groups), it is important to look for boundary spanning relationships and ties that were not used every day, One should also include non-users as well as users, who could equally well take part in WOM networks. It is also important to find out not only what people do (such as the moment of adoption), but also look for what people talk about, crucial to understanding the movement of information, and the way that people find out things.

2.11.3 Personal and Relational Influence

Discussion of the role of the social network, and specific relationships and links such as weak ties, and reference groups raises the question of the general mechanisms social and personal influence. (Rice, 1993) proposes a social information processing model coming out of social influence processes where there is exposure to the attitudes, information and behaviour of *valued and specific others*[79], or classes other others through three specific proximity mechanisms: *Relational*: the ‘cohesion’ relationship of close contact and

communication, where influence and information comes from the groups or cliques we are most strongly tied to, such as family; *Positional*: the relationship of people with similar status, roles, obligations and activities; which includes organisational proximity and the commonly used idea of *Structural Equivalence,* where influence is not from personal sharing, but from being subject to similar conditions, pressure and attitudes as equivalent others*;* and finally *Spatial Proximity:* physical co-location, or a neighbourhood effect, where just working or living close to someone increases the likelihood of interaction and influence, and involves sharing the same spaces and stimuli[80]. Research on specific issues and in specific networks should examine the relative importance of each of these mechanisms, and how they work in practice. There is also the issue of influence being a group effect or an individual effect – the result of shared norms or of personal influence.

Using this type of model, Burt (1987) attempts to identify what sources of influence are more important in terms of the relational proximity (cohesion) and structural equivalence model. His analysis suggests that 'cohesion' influence (positional) is only really important for eager innovators, who share their enthusiasm with others of a similar bent, and were also more open to other sources of influence. For most people who adopt later, their reference point is others in *structurally equivalent* situations. While cohesion can be seen as cooperation, Burt saw structural equivalence as bringing competition into the equation. However it is possible to see that adoption in equivalence occurs when we see that an innovation is relevant to others in similar situations to ourselves.[81].

2.11.4 The Opinion Leader

The role of individual personal influence is highlighted in the concept of 'opinion leaders', individuals who have a particular strong relational influence in a network. Diffusion and consumer research literature and practice has long used a model mainly based on a rather inexact reading of Katz and Lazerfeld's two step model: the "notion of a dominant opinion leader in touch with mass media who exerts a homophilious influence on a set of passive

followers" (Gatignon and Robertson, 1985). The early work of Katz and Lazerfeld showed the certain individuals were respected for their opinions by consumers looking for guidance (Katz and Lazarsfeld, 1955). The *opinion leader* is supposed to be someone whom others will look to for guidance, as an authority in shaping their attitudes and beliefs[82] They emphasised the informal and familiar relationships that lead people to seek the opinions of those close to them who had knowledge and special interest in the particular topic: "The power of opinion leadership in the kind of face-to-face influence situations which we are concern [with] ... finds expression in informal persuasion and friendly influence, which probably does not derive from wealth or high position but from casual everyday contact with peers" (Katz and Lazarsfeld, 1955, p.325). Later research has opened this concept up considerably. Social network studies show that certain individuals are referred to for advice by many others in the community. However, what sort of advice is being asked, and how do those people get their status? In closed communities this is easier to answer, but what about in open social networks? Other questions include why do people become opinion leaders, and how does opinion leadership relate to innovative behaviour in adoption[83].

The role of the opinion leader has to be based in an understanding of personal influence. Weimann (1982) points out a number of issues wrong with a simple Personal Influence model, such as comparing negative and positive influence, word-of-mouth and visible influence and opinion and information sharing as well as seeking and giving. Gatignon and Robertson (1985) reviewed the literature in this area and found that the networks people use for information, and those that they are influenced by (conformity) are often different. Negative influence can often be more persuasive that positive influence depending on the credibility of the source, and some people prefer impersonal sources such as the media, while others, maybe those who are more gregarious, are more likely to respond to influence of others. In particular, the evidence appears to show that while there is considerable influence between similar people (homophilious), as the early opinion leader

work suggests, there is also a certain amount of heterophilious influence. Innovators may have no one in their network to refer to so they have to look outside. This can be related to the concept of weak ties, and to anthropological concept of the 'marginal' – one who transcends cultures and is critical for dissemination of innovations (Barnett, 1953).

During the period of this research Burt published more work on opinion leaders, trying to understand what makes someone an opinion leader, and if their influence really is to 'lead opinion' (Burt, 1999). He tries to reconcile the idea of the opinion leader at the centre of a social group with the idea of the innovator as someone of the margins of a social network, or with many weak links to other networks. This suggests that there is a very important role for information and opinion *brokers*, individuals with strong links to other social networks or other external information sources that brings ideas in, but not necessary someone who has a particular influence within a social group.

2.11.5 Community and Social Network

From the theoretical, we can pass to more empirical work on what sort of communities exist that facilitate PI and WOM, and the different types of social network that people have access to. Away from studies focused on diffusion, social network research has investigated the types of relationships that exist in communities. In particular, looking at the social network as a resource for social and economic support, and a source and confirmation of ideas and values. A raft of ideas and research on communities become relevant here covering the family, geographical communities, and communities of interest where ideas and interests can bring people together and form a basis of their relationships, i.e. the content of social exchange and personal relationship. Central to this has been concern about the breakdown of traditional geographic 'public' communities and the extended family, and the growth of the personal, or privatised communities (Bott, 1955, Davies, 1993 #173; Bell and Newby, 1974; Fischer, 1977; Wellman, 1982; Crow and Allan, 1994; Allen, 1996; LeGates and Stout, 1996)[84].

The personal community of colleagues, friends and family (kin) is highly dependent on the individual, their life stage and a number of structural factors. Different sorts of relationships also bring with them obligations, and are used for particular functions. Kinship and friendships have different and complementary role, roles which are certainly changing[85]. An example of structural differences in social network is between men and women. Gender is still an important factor in the sort of friendships people have, and what they are based on: men tend to have more freedom for sociability, and often base friendship around activities and clubs; women tend to use friendships in a more relational way, with intimacy and relational talk (gossip[86]) more important (Allen, 1996). Relationships reflect shared interests and everyday concerns, so we should expect ICTs to become a part of the talk of friendships as they enter people's lives. Friendship identity also involves 'them and us' distinction, so we should also expect to see talk about ICTs avoided when it is not an issue of common interest.

There are also other important types of communities: those based on organisations such as the workplace or civic life[87], and those around common interests, such as sport or fashion[88]. These interests may bring people together, but they also highlight the exclusionary nature of communities of interest. The 'community of interest' is a concept that has also come of age with the development of new communication technologies and the rise of the concept of the 'virtual'(Reingold, 1994). Local community networks may have broken down, but people are able to maintain their own communities extended over a much larger area using the car, public transport, the telephone (Wellman and Tindall, 1993) and now e-mail, SMS and the mobile phone. This not only enables people to hold together traditional social groups, such as the family or the old-boy network, but to belong to new scattered communities of people who share similar interests[89]. It also means that we can belong to groups that we choose *voluntarily* to belong to, and no longer have to rely on the physically local community and institutions[90]. There are many example of special interest groups, often with

considerable political and social influence now flourishing though new telecommunications technologies[91].

2.11.6 Conclusions

It is clear that most people are members of a number of communities based around a range of ideas and relationships of various strengths and meanings. We use technology to manage more varied and diffuse communities. Research needs to focus on the type of communities that people belong to, the type of relationships they have with others in those groups, and the role that technology can and does play in maintaining them. We have to understand why people belong to communities, what they get out of them, and what they invest in them. We can link this idea of community to exchanges and commitments in specific types of interpersonal relationship. In addition, this theoretical and empirical work on community obviously has important implications for the study of the diffusion of innovations, and the sources of knowledge, sharing, demonstration and support that people can draw upon in their engagement with technology. We have to investigate and understand the actual communities that people live into today, and how they are evolving if we which to understand the diffusion and development of ICTs.

Linking this work on social networks and communities, one is brought to the conclusion that one must look across boundaries of home and workplace to understand the adoption, appropriation and consumption of ICT. From the point of view of domestication the home is just one part of our personal community participation: our everyday life stretches across physical spaces and virtual communities. These real and virtual spaces where we feel at home too, as is recognised in English with expressions such as home town and home country. We can also see the that social network or community provides us with many things. It is a source of information, practical and moral support, practical resources and it influences our identity in many ways. More importantly it is the structure in which we share our lives, and everything in them.

2.12 Particular People: Lifestyle and Identity

This evidence suggests that different individuals in different circumstances will behave in different ways. There have been many ways of trying to classify consumers according to characteristics that can then be used to predict future behaviour. In the broadest sociological approach, class has long been a controversial, practical and theoretical framework. Geography and demographics, particularly gender, age, education, and economic situation are also very well researched. However, these broad macro-sociological categories have been found wanting, especially as the importance and meaning of gender, social class and age have radically changed in the past century (Livingstone and Bovill, 1999). Nonetheless sophisticated geo-demographic segmentation based on these factors has been developed for marketing[92].

Consumer research has looked to psychological and cognitive factors have also been introduced as 'testing' of aptitudes, values[93] and attitudes[94] etc has been developed, particularly trying to link attitude to opinions and behaviour[95]. Attitudes tend not to link to actual behaviour, they seem to shape the acquisition of information. Information can be obtained accidentally, by systematic acquisition and by invention of facts to fill gaps (Chisnall, 1985). Attitude towards something shapes the systematic acquisition of information, and also the information that is invented.

More recently the concept of individual 'lifestyle' has attracted considerable attention among market researchers trying to find new categories that are focused on the consumption behaviour of people, rather than on, say, their political attitudes or health. The concept of Lifestyle groups people according to supposedly common characteristics including attitudes, values, family status, occupation, education etc.[96], cutting across traditional demographic segmentation. Those with different lifestyles can be seen as having particular needs and attitudes to different product classes, and different resources available to adopt and use them[97]. What these approaches do not show is

how people see themselves and how these categories are constructed in real life, and why they should be relevant to the consumption of ICTs.

Others have tried to understand why people classified in certain categories, such as class, gender, tend to have certain attitudes, behave in particular ways or hold certain values: what is it about particular economic conditions, education, upbringing etc that creates a recognisable category, and appears to make people behaviour in certain ways. The idea of capital, whether it be economic, educational, cultural (Bourdieu, 1979), social or other has been suggested as an important feature of social categories.

There are not only features internal to each group relevant to creating categories: the relationships and contrasts between groups is what makes the differences important. Those in different groups are not only the object of the conditions, but identify with a social category, its conditions, values, etc. Defining oneself in opposition to others is also important: it is not only internal factors that are important, but also the contrast with or 'opposition' to the values and tastes of others (Douglas and Isherwood, 1979, 1996; Douglas, 1996)[98].

Another issues that challenges the idea of fixed social categories is a recognition of the way they change internally, their response to external change, and the movement of people from one category to the another. Classifications are rooted in cultural and material differences, and these are constantly in flux. The individual is also not the same as their classified group – each person moves between classifications, aspiring to other sets of values or material circumstances. Groups can also change as others aspire to join or change it. Technical innovation can provide the opportunities for people to challenge their culture and move out of it, consciously or not, or the opportunity to appropriate its products to maintain their culture. It can also provide considerable challenges to values and lifestyle, as they coerced into living in news ways, and have to defend existing values. A new technology can also be strongly associated with another culture, and rejected, or used as a symbol of the vulgarity, indecency, corruption etc of the other culture

(e.g. dangerous hackers and computers, mobile phones and yuppies, Internet and paedophiles, satellite TV and 'working class' culture).

If a technology is forced upon someone, then they may have some conflict of identify about what it means to use or own the technology. The process by which they make it their own or find a mechanism to cope with and control this 'alien' creature we have called domestication. This implies tension and the need for control, and the possibility of avoidance and divestment, as much as the idea of peaceful cohabitation. Some people find they have to have a technology, but put strict boundaries around its use, and would b very happy not to have to deal with it. Other people embrace the technology, and experiment with introducing it into other parts of their lives. Both approaches involve innovation and the development of new rules and routines.

Some people will embrace the technology but remain within the mainstream uses. Other people will use it to subvert, to get round restriction, or to undermine established norms of 'other' cultures. The mobile phone can be used to remain tied to other people, but can also be used to remain isolated. The Internet can be used to do home shopping, or it can be used to distribute illegal software, documents and music copies.

The idea of opposing lifestyles is fundamental to the idea of boundary, that on either side of the boundary there are opposing activities, values, communities that are somehow incompatible. In the study of attitudes to technology, oppositions of gender, age, personality are strong. 'That's for young people, I'm too old'. 'Only kids can understand this new stuff'; 'It's something the men talk about', 'that's women's business, I don't get involved in it'.

In the field of adoption, appropriation, domestication and consumption of ICTs, there are a huge range of factors, psychological and social categories that have been investigated, including not only established groups from social science, but also new categories specific to consumer behaviour and to current ICT. A review of some of the research in this area including the

idea of life form applied to teleworking, telecommuting, and flexible working (Qvortrup, 1999), and the types of users of web based media service is include in the Appendix. There are also issues of change over the life cycle that are very important for the adoption of new technologies: at different ages people have different motivations, experiences and commitments that shape their needs, attitudes and resources to adoption and use technology. Again, an exploration of these issues is available in the Appendix.

2.12.1 Adopters in Diffusion: Innovativeness

Diffusion researchers have tried to classify people in an adopting community according to the time in the diffusion of an innovation that they adopt a particular innovation. According to this one can measure the *innovativeness* of a consumer. Innovativeness was originally defined by (Rogers and Shoemaker, 1971) as "the degree to which an individual is relatively earlier in adopting an innovation than other members of his social system", where an innovation is "an idea or practice or object *perceived as new* by the individual. They developed a "mutually exclusive and simple system" where adopters are divided in time on an ideal S-curve of diffusion[99].

Innovators	2.5%
Early adopters	13.5%
Early majority	34%
Late Majority	34%
Laggards	16%

Table 2 Ideal normal spread of adopters (Rogers and Shoemaker, 1971)[100]

Numerous studies of innovativeness have come up with some broad general socio-economic predictors of innovativeness, for example, age not a factor, and formal education and literacy are important. Earlier adopters have higher social status, they have a higher degree of upward mobility, and innovations may be a way of getting there. They also have larger economic units (e.g. as owners or managers of farms, factories etc). However, while this give some general indications of innovativeness, the scale based solely on time taken to adopt. There are other problems to with this classification according to time to adopt:

1. The actual empirical evidence for these consumer traits in the literature is weak (Gatignon and Robertson, 1985).
2. Do innovators innovate because they are richer, or richer because they innovate? Many rich people do not innovate, but rich innovators can take the risk better (Rogers, 1995).
3. This post-diffusion scale does not work when there is only limited adoption in a community, and it does not account for those who do not adopt at all. (Rogers, 1995).

Products evolve during periods of diffusion. Technology development and developing uses modify the product, the meaning changes over time, and there is product diversification e.g. in the case of the 'computer' the earliest users had a very large expensive machines for industrial use – anyone following the 'diffusion' of the computer would have to follow a vast range of product that this has turned into. What the product actually is comes into question, as does the differentiation between products.

 Earlier and later adopters are very different in the way that they judge products, and the feature that are important, but they are complex rather than simple differences (Cestre and Darmon, 1998).

 When there are succeeding generations of products in the marketplace those who adopted one product early may appear to be late adopters of a subsequent generation of products.

 An individual may be innovative in one area does not mean they are innovative in another product field: "there is not a generalised innovator across product category or interest domains" (Gatignon and Robertson, 1985).

 Innovativeness in this case applies to the purchase of the product – not to the invention of new uses, adaptation, development of new meanings etc, which can occur in subcultures well down stream.

 What one individual perceives as innovative may not appear so to another – a product may be seen as uninteresting if it does not possess

certain qualities that are perceive a new or important – e.g. GUI (Graphical user interface) over command line interface.

Many people have tried to understand what it is that makes someone innovative in their adoption of new products, as there are clearly many social and contextual issues involved (e.g.(Hirschman, 1980; Gatignon and Robertson, 1985; Midgley and Dowling, 1993)). Hirschman (1980) in particular, looked at a number of features of consumers to see how they related to innovativeness, and proposes three dimensions of innovativeness: *novelty seeking; role accumulation* (life changes that trigger adoption) and *creativity* in problem solving based on experience with technology; and accumulated *scripts* or strategies for dealing with innovation are the basis of innovativeness[101]. This could also be referred to as *expertise* (Alba, 1987).

Hirschman also suggests that three types of innovativeness be distinguished, and investigators should pursue all three in their research: *Adoptive Innovativeness*: the actual adoption of new products, *Vicarious innovativeness*: the acquisition of information on new products, and *Use innovativeness:* which may not involve the adoption of a new product, but rather the novel application of an already adopted product[102]. While the construct of innovativeness is interesting as a personal characteristic, Hirschman focuses on the more interesting questions of how and why people are innovative: what are the circumstances that lead people to innovate, or allow innovation and what are the resources we are able draw on.

One result of this type of approach is to reconsider the widely used categories of consumers, such as innovator and laggard. Midgley preferred to develop the concept of innovativeness based on characteristics of the individuals with a definition of innovativeness as “the degree to which an individual is receptive to new ideas and makes innovation decisions independently of the communicated experiences of others” (Midgley and Dowling, 1978, p.236). The *innovator* is now seen as someone who is not influenced by their social network or community rather than the first to adopt ((Bass, 1969) in (Gatignon and Robertson, 1985)). The innovator may adopt

at any point through out the diffusion process, the fact that others have already adopted does not make their adoption or use any less innovative – indeed later adopters may be those who are more creative in their use of an innovation than early adopters. A heavy user of computers adopting the latest machine is hardly being an innovator, while the first person to use the machine for an entirely new purpose, or in a situation where computers have never been seen before *is* an innovator.

Rogers himself points out the problems with the concept of laggard, which as generally been taken to be someone with low innovativeness, resistant to change etc (Rogers, 1995). In fact the laggard is someone who may be innovative, or would otherwise be willing to adopt, and have the need, but is *excluded* for systematic reasons, such as lack of money, or is never exposed to the existence of an innovation due to their structural and institutional situation. Many new technologies could be relevant to a huge range of people, but they do not have the resources, and those promoting the innovation take the easiest route to promotion by going to existing user groups, and not attempting to promote the technology to others who may eagerly adopt once they are aware of the possibilities.

Other researchers have developed ways to classify consumers and users of ICTs according to their lifestyle and to their attitudes and use of new ICTs (Haddon and Hartman, 1997). However instead of basing their classification on the time of adoption they try to derive it from an analysis of individuals and their environment. For example (Clerc and Mallein, 1998)[103], consider products based on individuals and four structural variables, time, space, self and relations with others. They look for the meanings that an individual may give to a technology as they assess with respect to technologies they are familiar with, their everyday activities, the professional and personal identities and their professional and personal environment[104]. They pick up on the point that the main aim for technology developers is to satisfy the 'pragmatics', those who are curious and keen to know how they can benefit from the technology (Dunphy and Herbig, 1995). The 'passionée' or

innovator does not matter, since they are in a world of their own, adopting indiscriminately, rather than rationally (Sheth, 1981). The only possible benefit is that they can play an important role in innovating uses, and acting as 'experts' for other groups. They suggest two other main groups as well: people who are not so enthusiastic, and even resent the technology coming into their lives, but recognise that it is a useful tool for their work and have to get on with it; and a group that really resent the technology or do not feel able to cope with it in any way.

2.13 Resources, Barriers and Triggers

This approach of looking at structural features and at the resources and opportunities for innovation leads to two final issues. First, we need to understand how particular practical resources and barriers are currently shaping the way people see new ICTs and the way the adopt them. Second, the adoption of innovations is often dependent on a *trigger* factor, such as Hirschman's role accumulation that makes people engage with that innovation.

Dholakia, Mundorf *et al.* (1996b) identify four practical constraints that influence ICT adoption and use: *money, space, time* and *skills*[105]. In a similar way to Williams and Edge (1996), they stress that limitations in resources do not limit adoption and use, but shape it. For example, time constraints may encourage people to adopt certain new ICTs to save time, while leisure time encourages people to spend on time-filling products. They suggest that for ICTs this shaping is often in the direction of simpler, smaller and cheaper products: limits on the resources of potential users drive innovation by producers to solve the problems of resource limitations. When adoption of technologies is widespread, these limits on resources start to be seen as *barriers* to adoption, preventing certain consumers from benefiting from advances that have found acceptance and use by others. Producers identify particular barriers to adoption in different market segments or among groups

of consumers, and focus innovation in technology and marketing on reducing their saliency (Hughes, 1983, p.80).

The concept of *trigger* to adoption is suggested by (Stewart, 2000a). Adoption purely for the sake of interest in the technology itself is generally the preserve of the richest technology enthusiasts. For the rest of us there has to be some internal or external motivation for adoption. In the case of cybercafes I suggest four main categories of trigger: 1) *Life Events*: major changes in circumstances or occupation; 2) *Social Push:* the influence of the social network; 3) *Multimedia Pull or Instrumental need*: the failure of existing technology or techniques to work satisfactorily; and 4*) Curiosity and Interest in technology or content* the desire to develop knowledge in a new area, not restricted to the technology, but also how and why others are engaging with it[106]. This approach emphasises the emergence of particular, contingent factors that motivate people to investigate and adopt, rather than relying on rather general, or deterministic ideas of need and absolute resources.

Many of these issues identified in this section raise the question of why people do not adopt innovations: what attitudes, resources limitations, of lack of triggering motivation lead us to ignore, delay and resist new technologies that seem to hold so much promise.

2.14 Resistance, Non-adoption and Technophobia

It is tempting to only look at why people adopt and use new ICTs: in adoption there is a process to follow, a ‘before’, and an ‘after’, a conclusion to the process. Current users are expert on their usage, and can easily talk about what it means to be a user, as well as recalling how and why they became a user[107]. However, as those in marketing and sales know too well, one also has to understand why people do not adopt an innovation, or indeed any existing product or activity. Social studies of science and technology have also stressed the importance of a symmetrical approach to investigation: we must look at failures as well as successes. In this case, from the perspective of technology developers, or those with a positive view on the development

of the ‘Internet’ or ‘information’ society, non-adoption is a failure of the product, but is this really the case?

Asking the question ‘how do people not use?’ is also rather strange, but none the less legitimate. In the chapter on how people use new ICTs (Chapter 6), the ideas of proxy use and reliance on others will be raised and illustrated. This section looks at the evidence for why people do not adopt an use particular technologies, and new ICTs in general, the strategies and process of non-use and non-adoption. It also looks at accounts of the experience of being a non-user or rejecter in a world where many are taking up these innovations.

Much consumer research on non-adoption looked at the individual, and saw their non-adoption as some sort of a personal problem – non-adoption could be blamed on them ((Rogers, 1995)). Rogers points out that non-adoption, and discontinuing use is often a good, rational decision, it is the fault of the product and the promoter. There are also structural or institutional reasons for not adopting, often highlighted by anthropologists, and social scientists looking for reasons why the system excludes certain groups, such as women, ethnic groups, the elderly etc. (PAT 15, 1999; Shaddock, 1999; PAT 15, 2000). In many cases non-adoption is the ‘normal’ behaviour, given the costs and lack of relevance of most innovations (Dunphy and Herbig, 1995).

Rogers (1995) highlights the need to do studies of adoption and rejection asking the question ‘why’, and investigating the process in action rather than after the fact. However Rogers is also a promoter of taxonomy of adoption that groups adopters according to the time that they adopt in the diffusion of an innovation. ‘Innovators’ are the first to adopt, and the last to adopt are ‘laggards’ which is widely taken to mean that they are somehow backwards, traditional, uneducated etc. However much other research ((Stoorgaard and Jensen, 1991; Berg and Aune, 1993; Bauer, 1995a; Wilkes, 1995; Miles and Thomas, 1996; Glassier, 1998; Mick and Fournier, 1998) show that there are many reasons why people do not adopt particular technologies, because they are unable, because the products are irrelevant, because of community

rules[108], there are 'better' alternatives, and because even minor innovations may involve considerable restructuring of social relationships, the obsolescence of skills (Dunphy and Herbig, 1995), and so on.

Non-adoption and non-use are not the 'mirror image' of adoption and use (Gatignon and Robertson, 1991), but a part of a range of different strategies for dealing with the appearance of a new innovation. Non-adoption and non-use can be sophisticated strategies of the informed and empowered as much as the result of ignorance or fear[109]. Non-adoption and non-use are not one type of behaviour that can be contrasted with adoption and use, just as non-adopters are not the 'opposite' of adopters.

In the case of my 'experiment' in the Internet or information revolution, I am looking at what innovations come into the view of 'ordinary people' and whether or not are adopted, or rejected, or just ignored. The way that people cope with new innovations around them involves a range of strategies that include both appropriation and rejection. I look at this process in detail, knowing what products and ideas are being generated by industry on the one hand and on the other noting tracking their relevance, availability and appropriation by individuals and groups in society. There are broad classes of products being developed, such as mobile telephony, the Internet, commercial tele-services, interactive television, and many particular instances, from the latest PC or mobile phone, computer game, on-line banking service, to every new Internet auction site and on-line discussion groups. When someone does not use a particular product or service it may mean the rejection of that innovation a class of products, or of a particular configuration. In a period of social and technical change, this rejection may not last long: circumstances, knowledge and services and technology all change very quickly, and an non-adopter, or rejecter, may become an expert user within a few years.

This change creates unusual circumstances for adoption. The normal diffusion process for an innovation means that the knowledge and example of use of innovations takes time reach people. When these innovations are

changing rapidly, and occurring in many different areas of life, many alternative messages and examples are being passed around, often conflicting and confusing as well as stimulating. Innovations often challenge the existing order and activities, and until there is some stability, many people will see them as either unnecessary, or destructive. Only a minority will be forced to adopt, or have the resources or inclination to experiment and innovate themselves.

A feature particular salient to ICTs is that early technology has been complex and demanding of expert knowledge, creating an image that it is out of reach and irrelevant. Early uses and users have been highly specialised or remarkable, and the innovation comes to be linked to those users and uses, even though it may have become much more accessible. The same is true today: innovations in new product categories are often fraught with problems and hard to use, making it a rational to wait and see before adopting, even if one is interested and has the resources (Chapter 7).

2.14.1 Resistance to Innovation

There are a number of different research literatures that investigate issues of resistance and non-adoption.

1) Diffusion of innovations literature looks at non-adopters of particular products according to the time in the diffusion of an innovation that they adopt, and tries to find ways of predicting why some people adopt later than others. This involves looking at the importance of psycho-demographic variables, age, gender, income etc, and developing constructs such as innovativeness and cosmopoliteness to explain adoption tendencies. Resistance can be measured through rate of adoption and non-adoption in different markets (Bauer, 1995b). It also looks at the characteristics of the technologies and the supply network and the way they fail to satisfy and delivery appropriate products to all potential users. This study of adoption develops models of processes of adoption, suggesting different stages in a process where *non-adoption* decision can be made. However limitations in

focusing adoption have lead to the conclusion that rejection needs to be studied as well (Midgley and Dowling, 1993).

2) Domestication and Appropriation literature looks at how a community adopts technologies, the different interpretations and levels of engagement that different members of the community have with a technology, and how it becomes integrated into the relationships and activities of that community. The members of a community generally have different degrees of use and control of a technology, including those who have very little use and highly resistant to the product or service. Nonetheless they are obliged to deal with it in their community from the perspective of an outsider. The approach looks at the strategies that are used resist and control the adoption and innovation of technologies and activities associated with them.

3) The technophobia approach looks for reasons why people do not adopt or use a technology, even to the degree that they suffer from being in contact with it, or from not being able to use it. It tries to understand the social and psychological issues behind their non-adoption and non-use (Brosnan, 1998). This approach helps understand seemingly irrational resistance to technology. It is often measured by psychometric tests.

4) The exclusion approach looks at why some people in a community do not and cannot engage with new technologies, and the ways they might suffer extreme anxiety or be excluded from economic and social life, and personal development as a result of not adopting a technology (PAT 15, 2000).

5) The resistance to technology approach looks at the reasons why people oppose and resist technical change, and the strategies they use to articulate this resistance. It looks at degrees of resistance and non-adoption, and differentiates different types of resistance to technology (Bauer, 1995a; Szmigin and Foxall, 1998).

In addition, adoption models of the consumption and appropriation of technologies can also be used to look at why people do not adoption and do not use particular products from a cultural perspective. Models of how we

consume products can be reversed to look at how we do not consume, highlighting issues of personal and community identity, the role of personal networks, negative subjective reactions to technologies and difficulties of integrating technologies into activities and communities.

2.14.2 Rejection and Resistance

I have used the words rejection and resistance here, as synonymous with non-adoption and non-use, but this is not the case. Nor do these words completely capture what non-adoption is about. There are many reasons why people do not adopt. Rejection implies making a *choice* not to adopt and use. However there are other reasons that are very common, such as lack of resources and money, lack of skill, or total ignorance that there is an innovation to adopt at all. Why people reject is still a problem for industry and research, as many people who it would appear could benefit from an innovation and would appear to be interested do not adopt (Midgley and Dowling, 1993).

The concept of rejection does not only apply to a decision not to adopt a particular innovation, but covers a range of actions that include rejecting an entire class of technology or innovation, as in the case of someone who decides not to use computers. There are other dimensions to the way we decide to reject a technology. The rejection may only apply to a part of life, such as deciding to keep computers out of the home, or private life, despite adopting or embracing them in professional activities.

Other researchers prefer to use the general term ‘resistance’, which implies the blocking of the oncoming train of innovation. Resistance can have various motivations that are based on specific fears and grievances, such as fear of job loses, or specific environmental damage, to more general moral or intellectual objections to innovations, especially backed by industry. As well as the type of resistance, we must also take care to see what the target or object of resistance is suggested noted earlier. Bauer suggests a four possibilities: the *machine’*, (Luddites), the industrial or government *power*

behind an innovation; the *implementation* of an innovation; or a *particular aspect* of an innovation. In information technology Bauer suggests the objects of resistance are often the consequences of innovation e.g. privacy invasion, data misuse and control, VDU radiation and RSI, use of artificial intelligence, loss in quality of working life, de-skilling, changing job structures, bad user interfaces, redundancies, and concern over issues such as pornography, hacking, and databases (Bauer, 1995b).

This resistance can often be part of a social movement[110]. On the other hand it can be based on personal anxieties and attitudes commonly considered to be 'irrational', sometimes called 'technophobia'.

Whether using the term rejection or resistance, it is helpful to differentiate three groups of objects of resistance:

- Resistance to, or rejection of technical innovation in general.
- Resistance to a class of innovations, such as ICTs.
- Specific resistance or rejection of a particular innovation.

While inter-linked, for the individual and their community the motivation and performance of the resistance can be very different depending on the level. By deciding not to use new ICTs, a non-adopter does not have to decide to reject any particular product, but someone choosing a new computer has to make the choice of one, rejecting all the others.

Bauer (Bauer, 1995a) investigates the idea of resistance to technology, or the 'refusal to comply' with expected or 'normal' change[111]. Developing a taxonomy of resistance based on active or passive resistance, classes of resistive action, and the level of resistance He proposes three distinctions: *rational/irrational* resistance which highlights that much apparently irrational resistance is perfectly rational; , *resistance/opposition*, where resistance is based on holding values opposing those of the system that is promoting a technology; and the problem of self reference, or *avoidance behaviour,* often because it takes no effort not to adopt[112]. These distinctions are also found by other researchers (Mick and Fournier, 1998; Szmigin and Foxall, 1998)[113].

There is a continuum of behaviours (Fournier, 1998), from passive avoidance to an active opposition, passing though various strategies of minimisation of contact that do not involve confrontation with the system or source of the technology, but involve coping with it in a more personal or private manner.

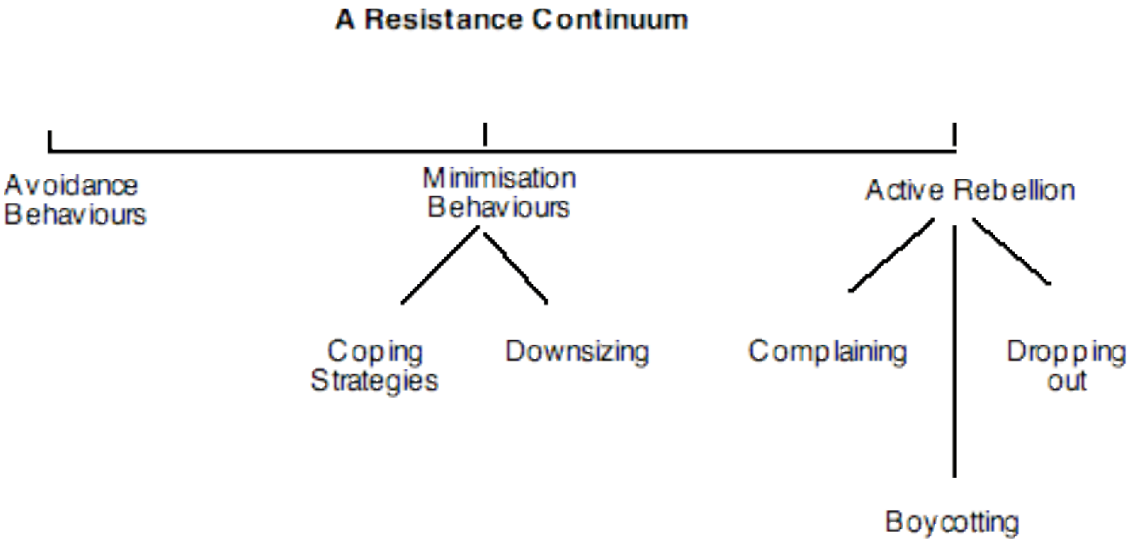


Figure 3 A Resistance Continuum, from (Fournier, 1998),

As well as these main types of resistance, there are different ways they can be put into effect: Bauer suggests two types of resistance – active and passive[114]. Active resistance is taking positive actions to avoid or fight against innovation. Passive resistance is 'wilful inactivity'. One manifestation of this wilful activity is a delay (Mick and Fournier, 1998) or postponement (Szmigin and Foxall, 1998) in adoption of a product, with the expectation that one day it will be adopted, but for what ever reason it must be put off.

(Nabih, Bloem et al., 1997) attempt to bring together some of the ideas about how people reject or resist technologies with a simple linear adoption model. In a review of the literature they suggest that there are both active and passive resistance and acceptance of innovation that occurs at different levels of engagement with the product. Depending on how and when they rejected an innovation a non-adopter could be "classified as belonging to either resistors, postponers or rejecters" (Nabih, Bloem et al., 1997, p.192). On finding out about an innovation an individual can either ignore it *(passive resistance*), or in some cases proceed directly to trialling or using it (as in the

case of many imposed systems). If they are interested and move to an evaluation stage and subsequently do to consider it worth adopting, then the resistance is '*active*'. However even when there is a desire to adopt the product, this may be *postponed,* for some reason. Finally if they trial it and it is not satisfactory, then this can be called *rejection*. They offer a diagrammatic summary of this argument.

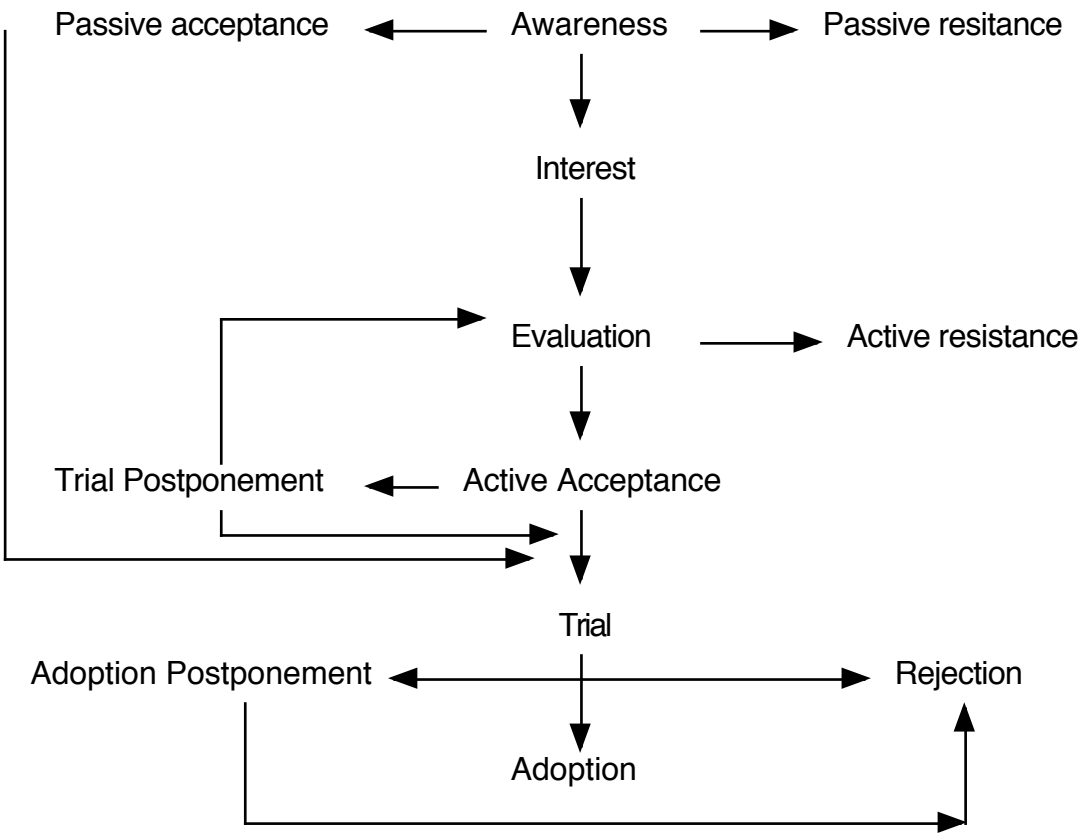


Figure 4 conceptual framework of innovation responses (Nabih, Bloem et al., 1997)

This type of conceptualisation is probably useful and needs examined in the light of evidence.

There certainly various levels of resistance, expressed in different ways, and with different targets for resistance. We can resist physical influences in our everyday lives, and put up cognitive resistance to the external information such as the media. Cultural and symbolic resistance can also be created or used, such as participation in 'alternative lifestyles' (Gabriel and Lang, 1995; Douglas, 1996; Dobscha, 1998; Schor, 1998), consuming alternative media

and cultural products, or making political or legal stands. What ever the type of resistance, these strategies are positive, and active, based on perceptions that the problems that the technologies will bring to our lives, such as 'enslavement' to the product, or the chaos and risk of early obsolesce that can come from adopting an early model. (Mick and Fournier, 1998).

It is clear that there are two issues: why people resist, reject or ignore, and how they do it. Both are related to the innovation and circumstances, and one often gives rise to the other.

2.14.3 Technophobia

One approach to explaining resistance to or avoidance of ICTs, and particularly computers has been to label this behaviour Technophobia. Technophobia implies some sort of irrational reaction to technology that is out of proportion with a 'normal' reaction to a machine. The source of this reaction, and whether it actually is irrational has been the subject of considerable research among sociologists and psychologists, particularly those studying gender and education, since technophobia appears to affect many more women than men[115]. Surveys and studies suggest that a third of the population show some of the signs of technophobia ((Brosnan, 1998) (BMRB, 1999))[116].

Rosen and Weil (1990) suggest different dimensions of technophobia related to computers: anxiety about current or future interactions with computers or computer-related technology; negative global attitudes about computers, their operation or their societal impact; and specific negative connotations or self-critical internal dialogues during actual computer interaction or when contemplating future interactions. They identify three major groups of 'technophobes' (Rosen et al. 1993): *uncomfortable users*, who feel they lack some knowledge, *cognitive technophobes* who may appear calm, but have negative thoughts, and *anxious technophobes* with classic anxiety features, sweaty palms etc. There are a number of different ways that a computer phobic can react to technology: *behavioural, emotional* and in their *attitude,*

all of which can be revealed by observation and in discussion about technology[117].

While technophobia can lead to resistance and rejection behaviour, negative emotions and attitude can persist when we are obliged to use machines, when it can result in stress and poor performance. Even successful use can still entail negative attitudes and general avoidance, as we shall see in discussion of ambivalence.

2.14.4 Common Features of Non-adopters

When we look at a group of individuals, can we find similar reasons for not adopting a range of technologies, or are the reasons specific reasons for each person and their circumstances? This question addresses whether we can create analytical categories of 'non-adopters', 'technophobes', 'technology rejecters', united through common characteristics, or whether these categories exist only in contrast to 'adopters', 'innovators' etc. Another way is to try and link attitude and adoption of technologies to other characteristics, such as those identified in psychographic tests and demographic factors[118]. Many marketing studies try to find different groups of consumers that have common consumption characteristics, based on demographics, such family status, employment, and education, grouped together with various 'lifestyle' attitudes and activities. Many of these can be useful, as long as they are continually updated. Even so, although they may offer a guide to whether a someone is more or less likely to adopt and use a technology, and how they use it, there are often many people in the group who do not conform to the stereotype. I will not attempt to recreate this type of categorisation according to demographics, although demographic issues emerge as being important: instead I look in much more detail at how particular contingent activities, life themes, events, relationships and experiences come together, illustrating how people become, and construct themselves as non-users, and how they experience this.

There are also many ways to be an non-adopter or a non-user. Just as there are ways to adopt, there are strategies to reject an innovation, avoid adoption, and avoid use. Strategies such as 'wait and see', or the avoidance of all contact with information about ICTs are common place. These strategies are developed in the light of different pressure and motivations both to adopt and to avoid, such as workplace pressure to use ICT, and fear of technology. As well as looking at the question – 'why does X not use Y technology?', one needs to look at the experience of non-use : what does it mean to be a non-user in a world where many people are adopting, and new technology is becoming an increasingly important part of everyday life. As other people become users, and people are offered at least the possibility to adopting, how do they feel and live as non-users. Does it affect relationships, job prospects, work efficiency, self-image? Are there positive benefits felt from not adopting particular products, classes of products, or limiting their use to particular parts of life? Or are those who do not adopt new innovations held back by circumstances, and feel they could be missing something?

2.14.5 Non-Adoption of ICTs as Non-Consumption

While it is suggested that resistance should not be seen as the mirror of adoption, it is very useful to apply an analysis of consumption to resistance and non-use, to see the issues involved in 'non-consumption. The model introduced by Holt that highlighted identity, practical and social uses and subjective engagement can be used to generate a more detailed set of possible factors involved in non-consumption of ICTs.

Subjective reaction: The emotional and attitudinal responses identified by Rosen and Weil (1990), including fear, anxiety, dislike, feeling overwhelmed, boredom on one hand, and feeling too old, that a technology is a waste of time and money, unhealthy, gut feelings of resistance and rejection of the technology or something about it, such as its political association with big business, or personal association with work, school etc.

Integration – *relevance, instrumental, practical, ownership, meaningfulness*: One is unable to integrate a technology into ones activities, whether productive or personal. This includes a judgement that a technology not relevant to personal activities, it is too expensive, of no use, or disappointment with its facilities, such as it not good enough or having poor performance, or comparing it with a better alternative. It may also be because one does not have appropriate skills, cannot get access, or can rely on someone else's use. This leads to a failure to personalise/appropriate, or negative appropriation experiences.

Classification: This deals with to self-identity as *a non- user, non- knower, non-owner,* particularly judged against others. We may define others as what we think we are not, such 'nerds', computer people, TV people, experts, yuppies, business people, richer people. Against this our self identity can be both negative and positive Negatively, as a non-expert, an outsider, idiot, being too slow, feeling inferior or stupid. Positively, as having a more 'natural life', being an outdoors person, a people person, or a family person. This raises issues of the relationship between self and others similar, and self and users/adopters/experts.

Play or Social Interactions: This covers relationships with others around innovations. On a negative note being a non-user may mean not being able to take part, exclusion from conversations, being bored by others more enthusiastic, or avoiding situations where technology is a key shared experience. Social relationships can also be used to remain non-expert/user, relying or exploiting on others. A nonuser can also be an active participant in 'play' around technology such as by arguing – playful or serious, where technology remains topic of conversation without use.

We can use this approach to hypothesise the responses to the imposition of a technology on someone who manifests some sort of resistance. There are three responses to this: a satisfactory appropriation, where the conflict of a non-user becoming a user is resolved; ambivalent consumption, where

problems of appropriation are not solved; and dissatisfaction, where initial acceptance turns to resistance after a certain time.

Resolution of conflict: Initial fear of technology replaced by an attraction. There is a reclassifying of self and the technology. The technology becomes subject of social interactions; and it is integrated into everyday activities successfully.

Continual problems Barriers are not over come. Subjective dimension: there is continuing uncertainty, insecurity, and dislike; Classification: there is a fear of becoming too much of a nerd, don't want the responsibility for the machine or task, feel oneself becoming a poor user, or less efficient worker, or maybe a trouble maker for those around.; Integration: There are limits of time, space, resources for new learning and personalisation, the technology does not fit in, and does not make tasks any easier or satisfying; Play : Adoption takes him/her away from the social group, so that non-use is no longer a shared experience etc.

Rejection after use: After a time of use problems arise, such 'over-integration', social isolation, distrust of the machine, an frustration with problem. There has to be a process of 're-incorporation', or 'dis-integration (e.g. stopping home use of a computer after work takes up too much family time).

Of course many real situations will combine problems and benefits. Even if there are problems with a computer system at work, this can be a shared experience bringing people together. A piece of technology may be very attractive, but in fact turn out be useless in any practical way. Depending on the type of problems that people find in their encounters with ICTs there are going to be and different strategies to solve or deal problems, some of which may be strategies of resistance. These strategies of resistance can manifest themselves in various degrees. Miles (Miles and Thomas, 1996) identifies a number of levels of resistance of technologies:

1. Resistance to using a particular *feature* of a technology
2. Resistance to changes in *Product design*

3. Refusing to apply technology to particular *application*.
4. Resisting any use by oneself
5. Rejecting any use at all

Limiting use of technologies is probably a feature of nearly all users, and represents the way that we make a bounded place for technology in our lives. These limiting and coping strategies are often the result of experiencing opposing attitudes and emotions towards technology, leading to ambivalence.

2.15 Ambivalence in Consumption

A number of researchers have investigated the concept of 'ambivalence' in the adoption and consumption processes. Ambivalence is the co-existence of opposing or contrary feelings. (Otnes, Lowrey et al., 1997) reviews the literature on ambivalence and in research on the consumption of a wedding dress bring out the different types of strategies people use to deal with ambivalence There are various dimension to ambivalence according to their analysis, psychological, cultural and sociological, along which conflicts can occur[119].These conflicts can all be seen around ICTs from studies in the domestication of technology literature, and are issues raised daily in the press. For example there is a huge choice of computers and mobile phones, let alone web sites to use. People need strategies to deal with this. Some are strategies that can be put in place oneself, but industry also responds to the need, with the development of Internet search engines, magazines on consumer goods and the Internet, shops advertising their ability to help the customer through the minefield of products etc.

Mick and Fournier conducted a series of in depth studies of the paradoxes of using and owning ICTs (Mick and Fournier, 1998) and found similar types of coping strategies. Their respondents had to deal with uncertainty and complexity (Table 4).

Coping Strategies	Emotional Effects
Pre-acquisition avoidance	
Ignore	Avoid information about technology, characteristics or availability
Refuse	Decline opportunity to own
Delay	Postpone ownership
Pre-acquisition confrontation	
Pre-test	1. Use someone else's temporarily, 2. Purchase intending to return
Buying heuristics	1. Latest model 2. Basic model 3. Expensive model 4. Familiar brand, 5. Reliable brand
Extended decision making	Taking stock of needs, information search, calculated purchase
Extended warranty/maintenance contract	1.Buy additional insurance 2. Service agreement
Consumption avoidance strategies	
Neglect	Temporary indifference towards product
Abandonment	1. Discontinuation of use 2. Non-repair
Distancing	1. Restrictive rules of use 2. Placing object out of way
Consumption confrontation strategies	
Accommodation	Changing routines, preferences, tendencies according to perceived requirements, abilities or inabilities of a technology possession
Partnering	Establishing a close, committed relationship with technology possession
Mastering	Dominating a technological possession by thoroughly learning its operations, strengths and weaknesses

Table 3 Strategic behaviours for coping (Mick and Fournier, 1998)

The idea of ambivalence and coping appears to be a useful to the understand the conflicting emotions, and the problems faced when adopting new technology, or living in an environment where people are adopting. Such conflicts could include:

- non-adopters feeling left out, left behind
- adopters hating the computer but not doing without it
- mobile phone against principles, but need to have one

Otnes *et al.*(1997*)* show that there is conflict between expectation and reality. In the process of adoption and non-adoption this idea of 'expectation' is very important. We often have a number of expectations, both positive and negative, about adopting a product, and of resisting it[120]. Actual adoption

may not be determined by expectations, but the way we appropriate is. Of course on adopting something expectations can be confirmed or overturned leading to satisfaction, disappointment, surprise at benefits or confirmation of negative expectations. One way to follow this process is do to a longitudinal study of technology encounters and adoption.

2.15.1 Satisfaction, Dependency and Love of technology

The adoption of a product can lead to a number of different emotions. Our experience of these is not just based on a naïve engagement with the technology, but as we have seen it is just the next stage in an appropriation process that included the formation of expectations prior to adoption. Pre-adoption expectations are formed through our engagement with the idea of the being a user, or the benefits and costs, personal and vicarious trial etc. This process does not stop when we adopt, although of course this is a major event in confirming or disproving expectations. Mick and Fournier (1995) investigate the idea of satisfaction, taking it beyond a rational model of 'satisfaction' with a product based on pre-adoption criteria. They find that satisfaction is seldom based on pre-consumption assessment, but emerges and is constantly under revision. Building on models such as Oliver's five modes of satisfaction – Contentment, Pleasure/Displeasure (relief/regret), Novelty and Surprise (Oliver and Swan, 1989), awe, love, trust, dependency, frustration and helplessness are identified as alternative dimensions of satisfaction[121]. This highlights that satisfaction can come from absence of negative expectations as well as positive factors, and it often involves the development of quite intense subjective feelings towards the product.

Most consumer studies look at level of satisfaction based on the transaction, and the confirmation or dis-confirmation of pre-consumption standards, and how this can be used to predict attitude change, repeat purchase etc. Domestication studies tend to look at the place of the product in use and do not link it to pre-adoption expectations. These studies do not however appear to look at the pre-adoption processes, and the development of expectations. Mick and Fournier attempt to deal with this in their study that not only deals

with pre- and post-adoption, but also the longitudinal experience of consuming multiple generations of products and services. This is also the aim of my study.

2.16 Reactions and Engagement with ICTs

We have seen in this discussion a wide range of reactions to innovations and technology, and illustrated the many ways that people engage with them, from enthusiasm to hostility, as a tool for work, or an instrument for self-expression. Levy summarises very well what we as consumers are like, and the contradictory forces that drive us to search for the new, or stick with the old (Levy, 1998). On the one hand, consumers are curious; they want what is new and different; They want to acquire what is new and available; they are optimistic; they want to be part of the in group; they are impatient and petulant. One the other, consumers are sceptical; they think it is not good enough yet; they are stingy or conserving; they are technically challenged. Levy considers that we adopt many new technologies because of the gratifications they bring: they intensify personal expression, enhance communications, facilitate productivity and satisfy playfulness. There is also a search for entertainment and for knowledge. Two particular features are central to what we look for in new ICTs: their ability to bring us *freedom and control.* However these innovations also bring new frustrations too.

Focusing now particularly on ICTs, the domestication work suggested that people make a range of interpretations of technologies, that is intimately tied up with why they use them and how they use them Examples were given from Livingstone, looking at issues of control, sociability, privacy and function(Livingstone, 1992). Aune (Aune, 1996) suggested that there were expressive, creative relationships with technologies and instrumental relationships. Hickman (Hickman, 1988) suggested a range of expressive ways we engage with technology. On a more everyday level Frissen and Punie (Frissen and Punie, 1998) study the meaning of technologies in busy households. They found that attitudes to ICTs were very mixed, never

entirely positive or negative. Social non-acceptability has a retarding effect on adoption, e.g. people embarrassed about having a mobile even though they are very happy having it. Sometimes people wanted to make them selves unavailable sometimes, but find it morally wrong to use the answering machine to take calls. ICTs were generally not explicitly perceived as solutions in themselves, but ways to create flexibility.

Time saving technologies. Useful instruments to organise life	**Time consuming technologies** Not useful
Flexibility Mobility Interactivity (telework)	Lack of flexibility and control Info/communications overload Threat of privacy Socially unacceptable Surplus value not recognised

Table 4 Time saving v. Time consuming in (Frissen and Punie, 1998)

Mick and Fournier (Mick and Fournier, 1998)find more evidence for ambivalence and paradox in the consumption of technologies. In a study of use of ICTs they suggest eight practical paradoxes which must be coped with by the consumer:

Paradox	Explanation
Control/Chaos	For order or upheaval and disorder
Freedom/enslavement	Independent and less restriction, dependent, more restrictions
New/obsolete	Latest technology, or will soon be outmoded
Competence/incompetence	Facilitate feeling of intelligence and efficacy, or ignorance or ineptitude
Efficiency/inefficiency	Less time and effort/more rime and effort
Fulfils/creates need	Fulfil needs and desires/ lead to awareness of needs and desire previously unrecognised
Assimilation/isolation	Facilitate human togetherness, lead to human separation
Engaging/disengaging	Facilitate involvement, flow or activity, lead to disconnection, disruption or passivity

Table 5 Paradoxes in consumption (Mick and Fournier, 1998)

Using this material I have been able to build up a more comprehensive picture of the range of contrasting reactions to and expectations of ICTs. One such opposition is between the Utility and Engagement attitudes, i.e. whether the ICT is seen as a tool for efficient and effective working, or as something to be explored. These types of reactions are often seen as contradictory, as

in Aune's Instrumental and Expressive users (Aune, 1996), who see computers as either functional tools of efficiency, utility, time saving and simplification, or toys, worlds to be explored, that excite curiosity, engagement, attachment and are used to fill time[122].

In both these interpretations there is often a need to 'master' the technology, to give maximum efficiency, or to give maximum understanding and pleasure[123]. For some people mastery is very important, either because they want a feeling of control over the technology for instrumental reasons (nothing must go wrong) or for expressive reasons (knowing how everything works). For others, mastering the technology is unnecessary or even undesirable. As many products have too many functions, it is a waste of time and energy to learn them all. Some people however find even mastering the basic functions difficult, and lack the confidence to try to master the technology. This can be a source of pride or insecurity. Some people are proud of not knowing how to use something, or how it works, while others feel that it is not their place to know, that they are unable to know. In all these cases self-identity is an important dimension of the actual knowledge and skill. Since we are looking at more than just the simple use of the technology, but the engagement with a constellation of evolving technologies and uses we can must refer to a range of different knowledge associated with technology. As Rogers points out there are different levels of knowledge: awareness of existence, how-to-use knowledge and knowledge of the principles of the innovation(Rogers and Shoemaker, 1971). The degree to which someone engages with a technology on these three dimensions is also an important guide to how they deal with technical change and consumption of technology in a community. The 'master' of a particular device may only know about that device and not be interested in any other. This will create a very different set of expectations and transferable skills in dealing with innovation than someone who is a 'nerd' knowing about all the products on the market, or has a detailed engineering knowledge of how it works. It is possible to hold contradictory attitudes towards different sorts of knowledge.

The next set of oppositions, that I suggest in the following tables, goes more deeply into the contradictory, positive and negative reactions or attitudes, and brings together on the findings of research previously reviewed. Here various sets of related attitudes are set out in groups, and in opposition to each other. The terms in each column can sometimes be grouped a pairs of reactions, but this is not a rule. More often a paradoxical or ambivalent reaction comes from attitudes in two quite different categories, e.g. a mobile phone could be an freedom giving tool, but at the same time the user could feel uncomfortable in owning and using it in certain circumstances.

Contrasting/opposing interpretations of an ICT/ICTs: Can be applied to users and non-users, those around users, from experience, or expectation		
Positive	**Negative**	**Comment**
Control		
Control Freedom Flexibility Convenience	Chaos/out of control Struggle Constraint Subjugation/enslavement Overload	What is the balance of freedom and control v. constraints and problems
Social/interpersonal factors		
Belonging Sociality Privacy	Compromise Exclusion Isolation Dispute Surveillance Over availability	How do the technologies affect relationships with others – in use, and in ownership? How about control over relationships and social life?
Productivity/time saving		
Functional tool Efficiency Effectiveness Utility Simplifying Quality Cutting edge Empowering Self-sufficiency	Constraint Frustration Struggle Inefficiency Burden Complexity Necessity Reliance	In applications where function and efficiency and innovation are important, does the technology deliver – how are these balanced with problems and constraints of the technology and social systems governing it?
Gratification/ time-filling		
Education Entertainment Play Community/Conversation	Time wasting Boring Task Anti-social	For non-work (paid or domestic) situation how is a technology judged?

Table 6 Contrasting interpretations 1

Contrasting/opposing interpretations of an ICT/ICTs:		
Expectations		
Confirmation of positive expectations Unexpected satisfaction	Disappointment Confirmation of negative expectations	Are expectations, positive or negative confirmed or contradicted: how does this affect satisfaction, future expectations?
Identity related to ownership and use		
Proud Owner Display/Status Sense of Belonging Demonstrates/ confirms Expertise	Embarrassment at ownership or use Unease at owning/using Exclusion/Isolation/Odd one out as user Incompetence	Does owning and using fit with personal identity, and norms of social membership/reference group/groups
Where is the technology taking me?		
Exploration Innovation Future Positive Subversion of Establishment Breaking boundaries	Frustration Obligation Bureaucratisation Commercialisation Dehumanising Antisocial Undermining values	Is the technology a 'good thing' personally and in general? Is it a creative tool offering fulfilling possibilities, or a tool for others to control, constrain activities and undermine values?

Table 7 Contrasting interpretations 2

The technology itself may give rise to one or other of these emotions, but generally they are intimately tied up with activity or task. The technology takes on the meaning of the activity, such as being associated with work or with play, or corresponds to values and identity. There is a transfer of meaning or the attribution of a situation or activity to a technology. The technology and its context *reinforce* each other. The technology can also take on a meaning by the way it *transforms* the activity or sense of identity etc. This may be when the technology improves control or provides a sense of freedom, or turns a pleasurable activity into a boring bureaucratised chore. As an example, the mobile phone is a solution to a desire for flexibility and becomes loaded with idea of freedom when it provides this. For others it may take on a meaning of subjugation or surveillance.

These rather complex positive and negative reactions and emotions manifest themselves most obviously as an movement towards or away from the innovation – resistance or acceptance.

Avoidance	Interest
Delay	Acceptance
Rejection	Curiosity
Resistance	Engagement
Avoidance	Enthusiasm
Reluctance	Reinvention
Submission	Addiction

Table 8 Avoidance v. Interest of ICTs

However as Mick and Fournier and Otnes point out these have to be turned into a behaviour through a number of coping strategies. This depends on the actual practical engagement with the technology. This could depend on the particular stage in the adoption process as suggested by Nabih *et al* (Nabih, Bloem et al., 1997). However in many cases these strategies have to implemented for coping with the actual consumption and use of the technology, either personally or by others.

This huge range of interpretations of technologies, and on many different levels, makes it clear how ambivalence can arise, and unexpected individual disappointments and satisfaction can occur. The interpretation of ICTs is linked with the practicalities of everyday life, such as time, money and space constraints, and the demands of families and employers, but also with deeper life themes and experiences of the world. These are bound to come into conflict, and the complexities, limitations and demands on technologies only confound this. Even the most enthusiastic user of technology can recognise problems of dependence, and frustrations, just as those more resistant people can see obvious benefits and harbour desires for more accessible products that they can benefit from. In a social context, where one has to take account of, and be subject to others use of technology, ambivalences are increases, but can also be overcome through the resources and support of the personal community and network.

2.17 The Recent Adoption and use of ICTs

In the past few years ICTs have exploded onto the market and into people's lives. While many of the large scale promise innovations have not materialised, or been very slow to arrive, many intermediate technologies and services, often the components of the grand visions, or early experiments have become prominent. The PC is now an established feature in many homes and offices and on the road in the form of portable and compact computers. The mobile phone has surpassed all other technologies in the rate of its adoption and use. Most organisations now use computers and computer services. The Internet also developed to swamp all other visions of network technology and service.

In recent years there has also been a huge explosion in research on the adoption and use of ICTs. The period of my study is 1996-1998, already historical, so I need to situate it alongside general research on adoption of ICTs from this period: specific finds and figures from other research that can put my study into context. A comprehensive review of data for the adoption and non-adoption of the Internet and other ICTs in the late 1990s was conducted simultaneously to this study, and gives a qualitative background and a discussion of supply side issues (Stewart, 2000b)[124]. One of the studies that comes close to my approach and my concerns was conducted by Katz in the mid 1990s in the USA (Katz and Aspden, 1997). This only covered the Internet, but brought out dimensions of the social network, motivations to adopt, and sources of barriers and support for adoption. Katz found that socio-personal development was more important than business, and since them e-mail has emerged as the key application of the Internet[125]. Those people with experience of Internet use had different priorities to non-users for adoption, and non-users have very different idea of what Internet is for, for example not identifying e-mail and communication as the main use of the computer. Local social and work networks were an important stimulus for getting on line, and these networks also played an important role in learning, suggesting that formal learning only plays a small part in the adoption and

use of the Internet. In dealing with on-going problems, the majority of people would first turn to their close social network for help. These figures reinforce that importance of the social network in the everyday use of the Internet, as well as in its adoption[126].

Despite the help of formal and informal sources, there are still many problems to getting on line and staying there. Katz uses the idea of barriers, faced by nonusers and experienced users alike. Getting on line was difficult: 16% claimed it was very difficult, 59% a little difficult, 25% not difficult.. Katz found three groups of people who saw different types of barriers: Group I: 59% cost was the barrier; Group II: no idea how to do it (48%), no way to get access (43%), too complicated (42%); Group III: discomfort using computers 21%

Once on line there were problems too: navigation and traffic were main issues in use, cost coming third, It was too slow and too complicated and people wanted it easier to use, better searches guides. Nonetheless, despite all these problems millions do use the Internet everyday and find the benefits outweigh the difficulties.

Venkatesh (1996) conducted longitudinal and cross sectional surveys as ethnographic studies into the adoption of ICTs in the home. He describes the gradual uptake of home ICTs as they have developed. After much excitement in early 80s, the home computer revolution did not appear to happen. However despite not following the hype or pessimism, something happened, there was a transformation. In the 1980s, the PC still not a 'home computer', it was not something integrated into household. It was extension of office space. Relevant software not available, the machine was stand alone with no personal communications facilities[127]. In the 1990s this changed. Usability advances have meant that there is a new generation of users who do not have to master the technology. Many technologies are customised for home use now, and the emergence of new services on-line has revived consumer interest. Specifically he suggests a number of barriers to adoption that have existed, but are now changing with the latest

generations of technology, such as technical limitations, job oriented image of computers, gender bias in use, and limited stand alone functionality[128]. My research covered the beginning of this change. He finds many factors highlighted in other literature are important, such as gender issues, space, work-home boundaries, limited use of information services and general inapplicability of the computer to the home. However this has changed, as many households how adopt computer technology. What changed?

- Many new terms, e.g. multimedia etc.
- More areas in the household targeted – greater diffusion with in the context of the home.
- Many more software titles aimed at home use and household needs, powerful enough to fulfil them, and simpler to use.
- General acceptance as useful domestic technology. Computers are part of children's lives
- Realisation that the home is place for technology to reach full potential, home has become main site for technological innovation.

There has been a technical change, a change in the industry now able to invest considerably in domestic products, the adoption of computers by education, the rise of computer games, and a change in culture and perception of users of the value of computers.

Venkatesh makes an important observation about the inappropriate industry model of the home – the computer industry, with it control and information model of computer use, did not understand what might be relevant in the home[129]. Home users have generally had to make us of products for the commercial market marginally repacked for the home. For example the desktop computer is ideal for the fixed workplace, but for the home there is often not a 'place' for a computer. For a device that will be used for so many different purposes and by different people, having it in one place is very difficult. The television set once was fixed in one place and everyone had to use it the same way, but now most households have many sets in different

places. Most people have only one computer, but few in industry have attempted to deal with this issue by selling portable computers for the home (except of course Apple). Haddon (Haddon and Hartman, 1997) highlights the need for appropriate content on the Internet which many studies have reveal. The content has to be relevant, and for most people, relevant information is local rather than abstract. We need information most in our lives for the 'small, banal things of everyday life'.

2.18 A final note on terminology

There are a number of terms used to indicate the way that we take on board new innovations. Adoption, appropriation, domestication and consumption. All of them have spawned research programmes, and investigate similar issues from different angles. During the analysis of the study I constantly found myself switching between these terms, but a reading of the literature suggests that they are all highly flexible, and in the process of being redefined in use as more sophisticated models emerge of the way we engage with the material world in a consumer society. Because of this I decided to use the terms rather interchangeably[130].

Another terminological difficulty is over the verbs to *use* and to *consume*, and the nouns user and consumer. Much of technology studies analysis and certainly in the design of technology there are two roles, the designer and the user. However from the perspective of marketing, the person who buys the product or service is a consumer. As has been discussed before, the term consumer has traditionally been contrasted with producer, as reactive and active roles respectively. The term user tends to imply a rather intimate personal relationship with a technology, while the term consumer implies a relationship with a product that is still very much part of a broader symbolic and economic system that they are having to deal with. How can these be reconciled? One answer it is refer to the 'user-consumer', however I feel that in a similar way to the convergence of terms of appropriation, consumption etc, there has actually been a convergence of the analytic meaning of use

and consume, recognising the intimate relationship with the machine, and the extended relationship with the commercial and cultural system in which it is embedded. Therefore I tend to use the terms consumer and user interchangeably too.

2.19 Summary

This literature survey started by introducing the idea of the study of the use and consumption of technologies, particularly within the home, but also within the broader areas of everyday life, and across the life space. The consumption of goods is both a personal and a social process, related to the physical affordances and obduracy of artefacts, and the meanings given to them in an evolving social and technical context. Consumption was described as a range of ways of engaging with products, including the adoption process, and living with technologies in a social world, but also resistance and refusal of technologies. A range of theories and evidence was introduced to demonstrate this. These include Holt's suggestion that there are consumption activities focused on objects, and ones that are interpersonal, around objects, and the domestication theory, which looks at how technologies are appropriated. In technology studies, the concept of everyday life has been introduced as a domain to understand the use of technologies at a micro-sociological level rather than their design. I also introduce the idea of the life space introduced, highlighting the way that new ICTs are used across most domains of life, and are increasing linking them and challenging traditional boundaries. This suggests we need to look at how consumption and domestication processes work across the life-space, as technologies are encountered and appropriated in heterogeneous networks and spaces.

The process of appropriation on new products has also been extensively studied in consumer research and the study of diffusion of innovations. A review of this literature introduces many alternative concepts and ideas, but

again dealing with how new products are appropriated in a range of settings. Various dimensions of the adoption process discussed, including the characteristics of the product, the individual, with concepts such as innovativeness, and the role of events and experience, and the social dimensions of adoption. The adoption of new products and classes of products may be an individual process, but it is also social. The social situation, whether it be within a closed community, or though a broader personal network, is a sources of ideas, products, support and values. A variety of types of social grouping or relationships are described, using the concept of social network: the family, different sort of community, at home and work – emphasising that personal communities cut across boundaries or cross over between domains of life but are nevertheless constrained – some people have access to a broader and more diverse range of contacts than others.

Evidence and arguments were presented for different ways in which networks of different sorts play a part in the adoption and diffusion of ideas and products, used for forming opinions or finding information. This also highlighted the role of particular individuals in communities or networks, playing the role of opinion leaders, or experts, or change agents shaping the diffusion of products. One important feature is the way individuals mediate information and attitudes between the various domains of their life, acting a bridges. This is links to the idea that those on the edge of networks or with a wide variety of relationships outside their core communities are important in bringing in new ideas to those groups.

The alternative interpretations and conflicts in households over new ICTs, especially between those who are more enthusiastic and those more sceptical or unable to adopt, raises issues about how and why there is often a great deal of resistance to innovations, even those that eventually reach mass market penetration. A review of literature on non-adoption and resistance investigated issues of non-adoption, suggesting a range of reasons for resistance, degrees and focuses of resistance, and strategies for

achieving it.. Again resistance was characterised as both a personal and a social phenomena – related to needs and skills on the one hand, and meaning given to technologies, and an individual's relationships to it. Even among those who do adopt, there is often considerable ambivalence about technologies, and coping strategies are developed do deal with problems at various stages of the adoption and in use. Even those most enthusiastic users are ambivalent about some aspects of their favourite products. Ambivalence arises from mixed feelings that people have about technologies, and the review shows how ambivalence and concept of satisfaction can be used to link the focus of adoption studies, which tends to be the process leading up to adoption, and consumption and domestication, which deals mainly with appropriation, post adoption, and technology in use.

There are a wide range of different interpretations of technology, not only in what one could term resistance, but in ideas about how and when it should be used, for example, as a practical tool, or engaging toy. Bring together a range of research themes over interpretations of technologies highlights range of dimensions for engaging with ICTs, the many possible attractions or problems and the unavoidable ambivalence that anyone is likely to feel towards living and working with, or near, new technologies.

The review finally gives some qualitative data on how and why people were adopting the Internet in the mid 1990s, and puts this in perspective of how the facilities and image of computer technologies have changed since the 1980s, making them more accessible, relevant, and acceptable in the home.

The rest of this thesis investigates the issues raised in this review, using the insights and theoretical tools that have been brought together from various disciplines. In particular it investigates claims for the role of the community, or social network in the processes of appropriation, and on-going consumption and use of ICTs, and the role of particular individuals in this processes. Within this context of social consumption of technologies, the problems of adoption and ownership of technologies and the ambivalences and strategies for dealing with these problems are looked at empirically. The

same will be done for issues of resistance and non-adoption, but trying to go beyond the rather static interpretation presented here, to understand changes in attitudes and use that occur as much of the population adopts ICTs in many aspects of their lives.

Chapter 3 Research Design and Methodology

3.1 Aims

This investigation was concerned generally to see how new technologies come into the everyday lives of different people, and how in turn these people engage with these offerings: the way they are appropriated, including adoption, learning and struggling, but also other strategies for non-adoption, or arms length appropriation. Particular issues include the influence of knowledge, use and resource on ICT appropriation within and between domains of the life-space, addressing both opportunities for crossover and reinforcement of boundaries. More broadly it asked how the appropriation of technologies, such as the PC, the mobile phone and the Internet is proceeding now that certain technical elements and skills have left the domain of the early adopter. The study started from three motivations:

1. To study everyday use and context of technology in its broad rather than narrow definition, covering the whole of the life space. This sought to overcome the limitations of previous research that focuses rather exclusively on the home, or work, or clubs only, and generally neglects crossovers, (except when work comes in to the home in the case of tele-work). It is also sought to explore how the computer and some other technologies cross over between domains, and the supposed convergence of television, computer and telecommunications technologies.
2. A ‘person centred’ approach to living with technology, rather than an ‘artefact centred’ approach. With so many products being developed, rather than follow the uptake of a specific selected technology, which may fail, or succeed, this study looks at what is actually appropriated or engaged with by the respondents in different circumstances during a period of intense technological change.

3. A sociotechnical approach to appropriation, based on three levels. Rather than being artefact or system centred, the study recognises the socio-cultural nature of innovation in the 'information society'. It seeks to understand:

a) The biographies and appropriation of things or artefacts themselves.
b) The biography and appropriation and reinvention of proposed uses, programmes and visions that accompany artefacts. Often a particular technology may fail, but it is only a step on the way to adoption and development of a class of services such as home shopping, or the mobile office, computers in education. In an age of multiple competing technologies and service providers, the class of service is another key level of analysis. Reinvention of services and changes in attitude often occurs ahead of technical innovation, but nevertheless can be seen as part of the innovation process.
c) A third level is that of issues on the macro scale, but affect individuals and communities – issues such as privacy, reliance on technology, the effect on the news media, on national identity, the idea of progress through technology etc. This includes "tales of technological utopianism" (Kling and S., 1988) and dystopianism, as well as more concrete issues such as copyright. These may be harder to grasp, but they are central to the idea of the information society, are the subject of extensive academic business and policy work, and are debates that are accessible to everyone. They are also represented by particular products – such as government legislation, which is in its turn 'consumed' in its own way.

3.1.1 Research Questions

From these general aims, a number of specific research questions and issues emerged and were further refined in the course of developing the research design. The main questions are summarised below:

1. What are the crossovers between work and home and other domains of life in the experience and appropriation of new ICTs? How does technology help break down boundaries, or used to reinforce them?
2. What are the issues that make adoption and use of ICTs difficult, such at they create ambivalence between benefits and problems, and need practical and social resources to cope with them
3. How important is the local social network as resource and factor in the diffusion of technologies, and the appropriation process? (This question was particularly interesting since some of the technologies in

question are ‘network’ technologies, and their use depends on having other people to use them with).

4. Why do people not adopt new ICTs that are becoming popular all around them, and what does it mean to be a non-adopter? Can we also ask *how* people resist technical change?

These questions throw light on the greater issue of whether we can question an individualistic consumption and ownership model.

Two secondary questions that motivated the research, but are not examined in this thesis in details are:

1. How are people experiencing the convergence of technologies, industries etc, and engaging with the industry driven development of new classes of services and uses. Are there types of classes of uses developed by users, or parts of everyday life that are not part of the industry and policy agenda. How are, and may people respond to the key services that are being developed for new technical platforms, and what applications and services appear to be proving most relevant and popular?
2. How do the academic and policy issues around the innovation and appropriation of new ICTs form part of the experience of people not necessarily engaged with them directly? How do these issues become apparent and how do people engage with them?

In these questions issues of personal, social, functional and technical ‘context’ is be central. The Social Shaping of Technology perspective suggests a social constructivist perspective on one hand – the way that technologies, uses, concepts and roles are constructed in context and in ‘use’, but on the other hand stresses the influence of the characteristics of the technology, and in this case information and communications, in shaping the meanings and context. While the meanings of technologies may be shaped by the broader social and cultural context, and discourse, the technology itself has a powerful reverse effect.

Most studies of technology and innovations have found the same broad trends in use and adoption of ICTs, with age, gender, money and occupation being important predictors of attitudes, use and rate of adoption. Assumptions are made about the difference between the way men and women, or the young and the old, approach technology, and are addressed by industry. However as ICTs become less 'technological', and digital computing technology becomes more and more ubiquitous, I wanted to take a critical stance, not looking for stereotypes but trying to see from 'bottom up' observation how and why there may be different approaches to new ICT between people, based not only on demographics, but also on a range of other influencing factors. Do changes in employment, education and expectations alongside changes in technology challenge our stereotypes of women and men, or the old and the young? In order to tackle this sort of issue I needed to study a number of different milieu, with a range of people of various ages, occupations, resources, attitudes to technology etc, in order to get a range of different examples to compare and contrast. However the number of people I could interview would be limited by my time and the type of research method I chose.

3.2 Designing the Field Work

This research design builds on research done into use of technology and media in the home in the various other spaces using a qualitative research method[131]. This discussion of the methodology attempts to present some of the specific tools and experiences used to inform the design of the research and the development of an interpretation.

3.2.1 Studying the Process of Adoption and Domestication

Some studies of technology are aimed at building up a picture of the use of technologies in a social system at a particular time in a generally stable situation. Others investigate the process of domestication from the moment a technology is adopted. The processes leading up to adoption are generally investigated in hindsight. Diffusion studies tend to look in hindsight at the

diffusion of an innovation though a community, following one particular technology. Adoption studies, even those concentrating on word-of-mouth, and personal influence, do not look closely at the actual process of interactions in details, and seldom use qualitative research methods.

In my research I wanted to look at natural setting over a period of time, to try and see what natural encounters there were with technologies, why and how these occurred, and how people engaged not only with technologies, but with ideas about them too. I wanted to see how people linked innovations into their existing cultural and technical world, how different technologies were interpreted, and how they were appropriated. I wanted to uncover this process and seek to understand in the context of the everyday activities, relationships, background and events of the respondent. In particular, I wanted to see how processes within the social network played a role in the way people encountered and coped with innovations.

I developed a method of research, many elements of which I were reinforced by observations from number of researchers from different disciplines. Rogers (Rogers and Shoemaker, 1971) suggests that diffusion research needs to be much more process-oriented than is general. It should be qualitative, and follow sequences of events over time, to try and get closer to understanding the actually adoption process. He also suggests that instead of focusing on single innovations, we should see them as part of clusters, with adoption of one linked to others, especially when boundaries between technologies is not very clear. These clusters or complexes need to be investigated in an evolutionary sequence. He suggests we have to look for how these links are made by potential adopters, and not rely on the classification of experts. In particular, he suggest not falling for the *empty vessel fallacy*, assuming that potential adopters do already have the knowledge and skills (“indigenous knowledge systems”) to evaluate and use innovations relevant to their lives. In fact this is the approach of sociology of technology and of consumption – to understand how interpretations of an innovation are arrived at in the culture in which it emerges or is introduced.

Developing research out of the consumer research paradigm, Mick and Fournier (Mick and Fournier, 1995) criticise the lack of research that focuses on the on the context of consumption, the pre- and post-adoption aspects of consumption and the role of symbolic. They developed a methodology using phenomenological interviews to give insight into emotional responses, as well as rational explanations given in retrospective interviewing. In particular, they recommend multi-method approaches used in longitudinal inquiries in natural settings (Mick and Fournier, 1998).

Moores, who did several details studies of the domestication of radio and satellite TV suggest that future research should look to a range of ICTs, not just media technologies, and look outside the home as well as inside (Moores, 1996). Some have started to do this sort of research, such as Frissen and Punie (1998), who study the role of technologies in the lives of busy people.

Haddon, who has conducted much research in this field, makes a number of suggestions about the type of research that needs to be done to understand how people are appropriating the Internet (Haddon and Hartman, 1997).

> These include what the phenomenon symbolises to different people, including concerns that may make them wary; how they first encounter the Internet, what support they have and any problems they face; how it is perceived and maybe used in relation to other technologies and media; and where it can possibly fit into the time structures of households and individuals. (Haddon and Hartman, 1997).

Technologies must not only be put in the context of other technologies and the social context, but in terms of the activities that people do to make them relevant and meaningful.

> It might be more interesting to go beyond what people actually say about the idea of electronic commerce to consider whether current purchasing practices might favour consumption via the Internet. For example, if a particular household only buys goods and services from offices and shops and pays in cash, not even using a credit card, then arguably they are far removed from electronic commerce over the Internet - such a development would be a major new innovation for them. Whereas for someone already tele-shopping by some means, doing so over the Internet is a variation or extension of what is familiar to them. (Haddon and Hartman, 1997).

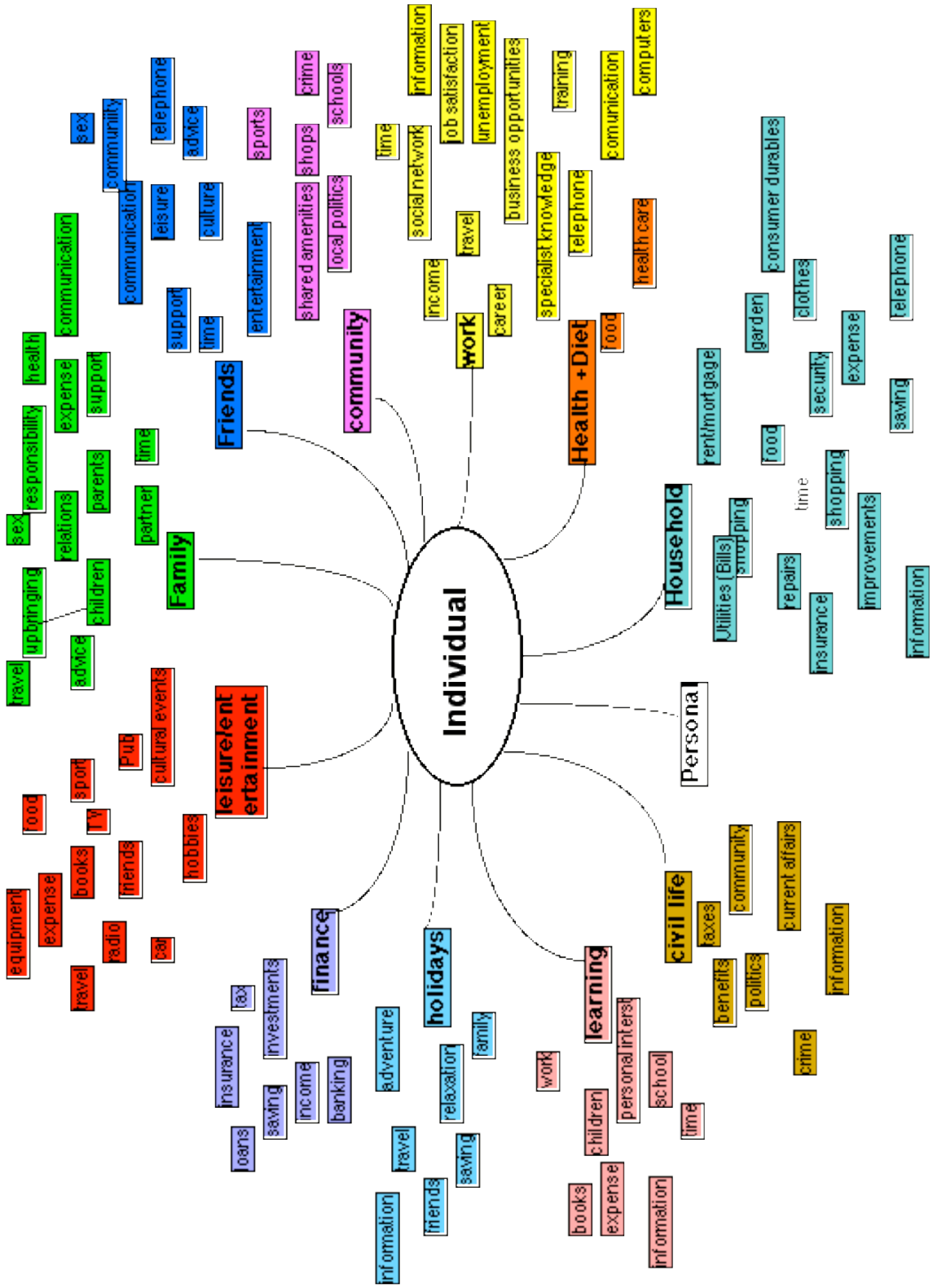
In studying a long term process of adoption, obviously it is important to find out what people actually do in their everyday activities, to understand how particular products, such as home shopping services could be relevant, and

how their adoption may correspond to existing practices, or represent radical changes in activities. In some ways we are trying to find out what people might 'need', not in terms of specific solutions, but as "an invisible phenomena that can be deduced from the structure of everyday life" (Desjeux, Taponier et al., 1997, p.253).

3.2.2 Focusing on the Life-Space and Technology

Venkatesh studied the appropriation of computers in the home and suggests that socio-technical studies have to "attempt to capture the structure and dynamics of computer adoption and use in the home, by looking at the interaction between the *social space* in which the family behaviour occurs and the *technological space* in which technologies are embedded and used." (Venkatesh, 1996) This is similar to much of the domestication research that tries to understand the structure of the moral economy in the home (Silverstone, Hirsch et al., 1992; Silverstone and Hartman, 1998). This involves looking at symbolic and practical structures of the home in terms of time, space, activities, roles, power relations, rules, and use of technologies. Studies of the workplace and computerisation take a similar view, looking to understand not only the formal organisation of work, but also the many informal relationships and activities. The aim is to build a model from the 'bottom up' model of *"how the user will derive value from the product or service"* (Carey and Elton, 1996, p.41/42), how they will make sense of in light of all their experiences across the life-space[132].

The intention of this study was to link the various domains of life, to study the 'moral economy' of both home and the work place, but also through relationships and activities that cross boundaries. Into this study of the greater life-space I needed to study how technologies arrive in this space and how they are domesticated. To do this I had to look at all the domains of activity and types of activity that made up people's lives, and could be affected by new ICTs. The following figure gives some of the possible areas of application of technology.


Individual
Friends
sex
community
communication
telephone
advice
leisure
culture
sports
entertainment
support
time
Family
health
expense
responsibility
relations
parents
partner
time
children
upbringing
travel
advice
leisure/entertainment
cultural events
Pub
sport
TV
hobbies
food
books
friends
equipment
expense
radio
travel
car
finance
insurance
tax
investments
saving
loans
income
banking
holidays
adventure
travel
friends
information
relaxation
family
saving
learning
work
children
personal interest
school
time
books
expense
information
civil life
taxes
benefits
community
politics
current affairs
information
crime
Personal
Household
Utilities (Bills)
shopping
repairs
insurance
improvements
information
time
rent/mortgage
garden
food
shopping
consumer durables
clothes
security
expense
telephone
saving
Health +Diet
food
health care
community
crime
shops
local politics
shared amenities
schools
work
career
income
social network
information
job satisfaction
unemployment
business opportunities
specialist knowledge
telephone
travel
training
comunication
computers

3.2.3 Gaining Access

One problem is to gain access to respondents, and the problems of being able to study them, and gain some familiarity with their world, or share their 'reality'. Social science methodologies propose many different ways in which this can be achieved, and guidance on the extent to which involvement in a respondent's life world is necessary to for particular descriptive or analytic ends. Practical problems include getting people to speak to the researcher at all, then getting them to be open, co-operative, and sincere in discussing the aspects of their lives that interest the researcher. More fundamental for research methodology is the reliance on the personal descriptions of the respondents, who may either intentionally conceal or mislead the researcher, or unintentionally mislead them. In studying someone's life world, it is unlikely that the respondent will be able to comprehensively and thoroughly describe not only their opinions and thoughts, but the details of everyday activities and relationships, and the context in which they conduct them, especially in the space of a relatively short interview.

Participant observation is a method that tries to surmount these obstacles, but at the expense of huge effort by the researcher, and can only be carried out in a situation where the researcher can actually live or work within a small group over an extended period of time. Since I intended to look at a number of groups, and across the social network of one particular member, this type of methodology is impossible. What is more, gaining access to the work place or social clubs may be possible, but living in private homes is very difficult. Only a few researchers have tried this (for example, James Lull in order to examine media use (Lull, 1990)). I wanted to study the way people encountered new technologies over a period of months or even years, when in fact key events may only occur very infrequently, so this did not make much sense. Other research methods used in media studies include asking the participants to keep diaries. This again is does not get any closer if especially if salient events occur very infrequently and outside the period of research interaction.

I wanted to interview not only users of new technology for whom the technology had a direct personal relevance, but also non-users for whom it did not. I expected that during the process of research many of the respondents would be likely to encounter and form opinions on new ICTs and have some engagement with the process of innovation and diffusion, however unwillingly. I had to find a method that would enable me to gain access to people who did not have any interest in the subject of research-new media technologies, and who would be difficult to contact or engage with though a research method based on current users. Especially for these people I had to develop a number of tactics to bring out the discussion of new ICTs, and to build an understanding of each person's life-world and the way that they encountered and engaged with ICT innovations.

3.3 Initial Concept of Research Method

Instead of selecting a range of established social groups, say a workplace, a club, a nuclear family, a group of friends, a shopping centre, I decided from the outset to use an Informer approach, taking as my point of entry an individual who would to some extent participate in the research as a co-researcher, and provide entry into their social 'world'. Blumer suggest that the researcher "seek participants in the sphere of life who are who are acute observers and who are well informed"(Blumer, 1969, p.41).

The research design then involved mapping the various other people that these respondents engaged with (both in relation to specific uses of ICTs and more generally) in different domains of their life sphere. I would then conduct interviews with those they work with, their family, their friends, and ask them to report on their experiences of traditional and new media and communication technologies. The Informant, and the others they identified, would not be selected on the basis that they personally use or buy any particular technology – given the symmetry principle that non-use is just as interesting as use.

The crucial point is that it is the Informant's social network and individuals within it that are being studied, not only the key Informants themselves. Whilst the selection of the initial informants would obviously have an important influence over research outcomes, any such shaping by the researcher would then be diffused as the interviews moved out to the networks identified by the Informants. Although such an approach does not eliminate the bias inherent in selection of respondents this kind of snowballing method does open up the range of people interviewed.

The involvement of the Informant was conceived as being important for practical and theoretical reasons as well - an informant will have to be engaged as a co-researcher who will provide access for the researcher to their social groups. I did not presume that the Informant's position would be un-problematic, but anticipated that there would be many difficulties with their relationship to the research, and their role in forming the opinions of their groups. In fact the informant role as a point of passage between social groups is very important - however they are unlikely to be unique points of passage in real life.

By interviewing a number of people who shared similar experiences and knew each other, or knew a common contact this method would also enable me to compare the experience and interpretations the respondents had of particular events, shared spaces, relationships and each other. This would make the study satisfy some of the basic demands of an ethnographic study.

The aim was to conduct this study on a longitudinal basis – with the idea of repeating the fieldwork after maybe 1 year, by which time I expected that there would be appreciable changes in the discourses and use of technology in society in general and in the groups being studied.

Interviews were conducted on a semi-structured basis with the help of a schedule of questions and issues (included in the Appendix). I also explored the use of other devices to prompt responses in a less structured way. Having carried out a 'dummy run' with these research instruments on friends

and fellow students, I then undertook an initial ‘pilot study’ with the first group of interviewees. Since I was attempting an experimental and rather unstructured research design, which potentially threw up further problems, for example in data analysis, the pilot study provided an important opportunity for assessing and refining the research design.

3.3.1 Designing the interviews

I was not trying to trace the network of influences, but rather study a group of people who interact at home, work and in other social situations, and compare their different approaches and study how they influence each others, and how the influence of third parties is passed on and 'negotiated' in the group. There is no need to do a complete network analysis for this, but in putting together the sample, an informants ego (personal) network is to be the basis for selection.

I had to design an interview guide that would investigate the individual’s background, their everyday activities, major and minor events in their lives and their relationships with others. This would include information on activities that are currently the target of the development of ICTs, such as workplace activities, shopping, banking, media, entertainment, communications and information use. I mapped out the range of areas of life that I might have come up in the following Table. I would then focus on the knowledge and use of ICTs and how they were engaging with them. Since I was investigating the adoption process, I also tried to find out how they went about adopting new products, covering information seeking, advice taking, buying, learning etc, for what ever product. This included the importance of different personal relationships in making decisions, finding out information, and forming opinions, compared with reliance on ‘public sources’ such as shops and media. I also asked about broader issues to do with the development of technology and its impact on society, attitudes towards change, and if they had knowledge of in policy issues involved in the ‘information society’.

The interview was flexible enough to range over issues that the respondents brought up. The main topics covered are in the table.

Background, life themes and history	**Information, Media and Communication**
Education background Family background Life history Important relationships Resources	Information use and attitude Media use Work communication Friends and family communication
Everyday activities and recent events	**ICT use and knowledge**
Events Life changes Work activities Domestic life Shopping practices[133]	ICT use ICT adoption Social Network's use of ICTs ICT attitudes Engagement with ICTs Knowledge about ICTs Problems with technology Knowledge of implementation of ICTs in government and industry Policy issues on ICTs

Table 9 Topics covered in interview schedule

3.3.2 Primary analysis of success of first pilot interviews, and comments for proceeding with concluding research on pilot.

The initial respondents were found through an acquaintance, a primary school teacher who agreed to help. She named a colleague and her family as her closest network, whom she shared most things. The details are given in the next chapter.

The first set of interviews was conducted in January 1997. All eight interviews were transcribed. The interviews explored the life of the participant - looking at domestic, social, employment, and economic situation, and some life history. It then looked at a number of everyday activities drawn from the original 'plan for looking' at new media in everyday life. The interviewing approach started not from technology, but from particular activities, and attitudes towards those activities, the social relations involved, and included instances of specific technologies. The questioning aimed to find out what the important activities, preoccupations and relationships are in the participants' lives, and their attitudes and practices around them. Then more particular questions were asked about technology in everyday life, based on

the earlier remarks of the participant, and introducing new themes. There was not an attempt to get them to define 'technology', or use my vague definition, but technologies were seen in the context of particular practices, activities and expectations.

I was happy with the results of the first interviews. They laid considerable groundwork for asking about the changes in use and expectations about technologies in context over the last year. However I made changes to the question schedule, mostly as a result of how I actually conducted the interviews, but also to reinforce some of the background material. For example, I needed to bring out more details of the relationships between the participants, and ask their opinions on the other's attitudes to information, technologies and the other activities and interests identified in the research plan. I also asked more about significant others that I was not interviewing, who lay outside the social circle of the principal informant.

3.3.3 Finding and engaging respondents

I found the rest of the respondents by focusing on finding principal informants with specific backgrounds that I thought would be interesting in the light of particular interpretations of the technology: these included computer entrepreneurs, artists, senior business managers, students and unemployed teenagers. I also wanted informants who would be interested in the topic and agree to help me persuade their family, colleagues and friends to help me. Through word of mouth and email-lists and a local cybercafe I found three informants who put me in touch with their personal networks. Details of the respondents are given in the next chapter in summary and in the Appendix in much fuller detail.

3.3.4 Conduct of the interviews

While I only met most of the respondents for the interviews twice, I spent a considerable amount of time with the Informants. I usually met them once to explain the purpose of the work, and get an idea if they would be interested and willing to help, and also if they could provide me with a network to

interview. In particular, I met frequently with the informants in Groups 2 and 3, who were developing very interesting multimedia projects. This included spending the night on the floor of one while visiting his home in a snowstorm in the north of Scotland. I visited them where they worked and in their homes for the first and second interviews, and in the case of groups 1and 3, travelled to visit other members of the group with them.

I made the interview the focus of a meeting in which I also tried to develop an understanding about how they lived, where they worked, the relationships with others, their interests and engagement with the subject by observation and in conversations around the interview. These conversations were used to make myself feel at home, and to make the respondent realise that I was not coming to grill them about their knowledge of complex technologies, which worried some of them. The conversations also revealed things about their relationships with others in the network, and sometimes raised issues that would not have come out in the rather more formal interview.

Coming to the second round of interviews was easier in some respects, probably due to familiarity of the interviewee with me and the process of the interview, and the more relaxed relationship between me and the interviewee However, while some of the respondents had had many experiences with new technologies over the gap, others had had almost none, and could not see the point of the interview. Nonetheless it was important for me to find out why they had not, and find out what they knew about the experiences of others in their network.

3.3.5 Second Stage Empirical Data Collection

The Second Interviews focused on current attitudes and use of technology, and investigate experiences and changes in activities, personal situation and technology awareness since the first interview. It looked for the role of others in these experiences. I attempted to get participants to tell more in-depth stories about their encounters with technologies, and the way these experiences were communicated and shared at the time, and subsequently. I

also wanted to try some other interview techniques to enriched the research. This is not quite 'triangulation' but a way to expand and deepen the understanding, rather than perform any alternative or cross-checking. For this I included interviewing in groups and using pictures to stimulate talk:

1. To discover what each participant knows about and is ignorant of, in relation to technological developments that have been announced by the 'supply side' of industry and government, particular functions and uses of new media technology, or issues raised by multimedia use. In the first interviews I waited to the very end to ask about awareness of the Internet, Digital TV etc, and offered short explanations if the participant did not know and wanted me to explain. Otherwise I did not. I wished to pursue a similar course this time, finding out how aware of these developments they are today. I used pictures, and scenarios based on their particular 'life-worlds'. This way I hoped to discover the depth of knowledge, and interest in developments in multimedia. This will enhance my understanding of what technologies or ideas the participant comes into contact with.
2. To investigate the importance of the close social network, and to use it as a reflexive tool to bring out shared experience, and differences in attitudes and knowledge. To do this I interviewed some of the respondents in pairs or group. This was aimed at bringing out stories that did not come up in our individual talks, and to bring up more details about the relationships. It was also an attempt to give me a closer insight into shared experiences around technologies, uses of technology and attitudes including what views are held in common, what has not been shared by the participants, how they rate different sources of information and influence, and their impressions of future developments in new media technology.
3. To investigate the interaction between different areas of everyday life: home, work, social, public, the different relationships with people in these different domains, different communications patterns, and the boundaries created between these areas.

4. To investigate changes in multimedia. Originally the research tried to focus on the aspects of everyday life that the supply industry has been predicting would be affected by new technology: e.g. shopping, information, communication at home and work, a range of work practices and activities, education and training, banking, entertainment etc. The questions explored these areas, focusing in advance on the issues that were arising from the supply side agenda, but allowing the respondent space to speak about how new technology was coming into their lives, and look for areas where it might do. Over the time of the research, a great many changes have come about in the use of ICTs - often in areas quite banal, and with unforeseen applications and technologies. The second interviews tried to uncover those experiences, and applications that have developed that are outside the main areas of hype.

The interviews looked for ways that new technology came to be judged or coped with. I specifically looked for engagement and utility dimension of relationship to information, communications, learning or entertainment systems.

The exercise showing the photographs was somewhat successful, although with some people they had no idea about any of the issues involved. The photos mean that it was easier to introduce the subjects. Sometimes it felt like going over old ground. Doing the interviews in groups led to some more information being divulged and the discussion that ensured were interesting as they revealed differences in knowledge, and attitude between those in the groups, be they a couple, a family etc.

3.4 Analysis of Data

I interviewed 29 people in 4 groups, with two sets of interviews, with each interview lasting between one and two hours. Computer-aids were used to assist the management and analysis of the mass of interview transcripts. The first job was to try and extract from this material quotes corresponding to all

the issues I had raised, and look for new ideas and issues arising directly from the respondents words. The NUDIST package proved extremely helpful with its powerful facilities for cross-referencing excerpts. Crucial to this is the elaboration of a set of reference terms. I developed a rough set of terms in analysing initial interviews from the first group – and subsequently refined these in the light of a larger number of responses. The aim was to balance on the one hand an openness to a wide range of responses, and on the other the need to group these experiences. This enabled a simultaneous investigation of the data from the 'bottom up', i.e. from the interviews themselves, and from the 'top down', engagement based on themes derived from existing theory and research questions. The categories generated and classified are listed in the Appendix. They proved very helpful in analysis, building up a picture of important dimensions of the experience of ICTs. However, as we see in the detailed empirical chapters, it was necessary to generate further more detailed schema for analysing particular aspects and processes in ICT adoption (and non-adoption). The use of computer-tools allowed considerable flexibility in this respect. These nodes were then linked further together in a number of emerging themes relevant to the network, technology, technology problems and attitudes, non-adoption, adoption, knowledge, communication and information use. Searches of the marked texts enabled groups of quotes reflecting different issues to be bought together quickly. However there was still a need to structure this in a simpler and more straight forward way in order to actually write the stories and compare and contrast experiences.

3.5 BEAN (Background, Events, Activities and Network)

To structure the resultant data a framework was needed that would focus on particular dimensions of everyday life relevant to understanding the way that people encounter technologies, think about them, adopt and use them. The approach I chose was to look at the data from four angles: Background or personal history, Events, Activities and the social Network or BEAN to make

an easily memorable acronym. This gives a way to assemble the contextual information, and to highlight crossovers and boundaries in the consumption, use and domestication process. It also gives framework for then moving to analysis based on domestication, appropriation, adoption, diffusion, and consumption models.

These dimensions are obviously not independent: activities are related to the network, and changes in activities and relationships. Many events could be argued to be particular types of activities that people take part in.

Background or Personal History: The respondents all have a history of experiences, of use and adoption of technologies and services that influence their activities and attitudes during the study. The personal history goes beyond this to broader history of relationships, education, and other activities. This dimension includes reflections on the life course of the individual or group. It looks at the possibility of personal innovativeness.

Events: There are three types of events that influence the adoption and appropriation of innovations: life course events, cyclical events, and one off social events or technological experiences. These events may be periods of considerable length (such as particular project at work, or the learning period for a new innovation).

Activities: these describe the spheres of everyday life in which the respondent takes part, such as work, school, family life, community life, and the activities they engage in within those spheres. The use and attitude to information, technologies and communication is examined within the context of these activities. These include work tasks, domestic tasks, leisure activities, media use etc. Activities will reflect, but not be actually linked to the stages of the respondents' life course. Changes in activities are linked to events.

Network: the personal network describes the relationships of the respondent, with whom they share spaces, ideas, decisions, experiences etc. The network is not fixed, but evolves over time.

These are now examined in more detail:

3.5.1 Background/Personal History

Background and personal history approach looks for the attitudes, experiences, knowledge and motivations of the respondents:

Life themes,

Motivations, values, attitudes that are broadly continuous during our lives, or through long periods. They include certain 'psychological' factors related to 'innovativeness', enterpreneurialism, self-centredness etc. outlook on life, attitude towards relationships and community, priorities. At any one time certain themes may be more apparent or easily expressed than at others. They can also develop over time as a result of major events and experiences (e.g. (Douglas and Isherwood, 1979, 1996; Douglas, 1996) and work on lifestyles (Chaney, 1996)). It is not obviously not possible to look at why these exist in detail: where the line between 'genetic', early life shaping, and later life changes is, and how we can change ourselves.

Past life projects, Past life events:

The past experiences and events that shape attitudes, knowledge, social network,

Knowledge, values, priorities and attitudes:

The attitudes and knowledge that are carried forward at each stage of life to the next.

Routines, repertoires, habits, beliefs:

There is nothing deterministic about the influence of our past on our present, new life projects can draw on this knowledge and experience, but can also be attempts to overcome, change or retreat from aspects of earlier life projects.

At the level of technology, media, information and communications there are:

- Experience of using and seeing technology, personal and vicarious
- Education in ICT
- Interest in innovation, new products and services
- Interest in information about the world
- Attitudes towards technically mediated or interactive activities.
- Particular experiences, personal habits and routines, myths and beliefs about ICTs,

3.5.2 Network

The personal network is those people we have relationships with in our daily life. It ranges from close and intimate relationships of family friends, through colleagues in 'public life' to casual, weak relationships, acquaintances etc. These relationships can be voluntary or obligatory, friendly or hostile, or anywhere in between.

Networks associated with life projects

e.g. family, work colleagues, friends from other activities

Knowledge and resources associated with networks:

The network brings with it knowledge and resources, obligations, division of responsibility and resources).

Shared myths of social groups in the networks,

History of relationships, shared experiences, knowledge of and about those in the network. Symbols with meaning exclusive or special to the network.

Cross over of networks.

Different networks in our lives can be kept separate or overlap. People have different sorts of networks – strong, close, highly connected, weak and dispersed, radial – an individual is part of several not overlapping networks.

Self-perception within network,

Relates to our own perception of our place within a network - our status, value, contribution etc.

Functional and symbolic roles in networks:

Responsibilities, status, influence, specialisation, demands. This includes what we do in the network, and how we are respected – the moral and the 'economic' roles and the stereotypes and images of others in the networks.

At the level of ICTs there are:

- People in network who use new technology
- Those who are trusted and accessible for information and advice
- Those who are considered examples, opinion leaders
- Status of technology knowledge and use in a relationship
- Use of technology in mediating relationships

3.5.3 Activities

These are the things we do – they are not always rationally explained by goals, and often emerge from compromises and restrictions, as much as from voluntary choice. Activities include routine 'everyday' activities. They

include maintain and developing relationships, motivation and goals, actions, consumption, creation and production, communication, and learning.

Current life projects

The activities that make up and support our life projects i.e. Work status, family status, leisure interests. These life projects are linked closely to life stage. These include all the things we do as part of jobs, studying, maintaining our relationships, managing our home, being a citizen, and a consumer.

Childhood	Maturity in work
Adolescence	Older children
Leaving home	Motherhood
Student	Children leaving home
Early unemployment	Divorce
20s	Second Family
Early Family	'Empty Nest II'
Delayed Single	Early retirement
Delayed Family	Young elderly
	Old Elderly

Table 10 Possible Life stages

Current Goals and motivations:

(Why, what) These are specific to life projects and to more general life themes, and are the reasons why we undertake (most of) our activities.

Priorities and pressures:

Limits of time, space, efficiencies sought – we prioritise activities according to pressures and restrictions, often trading off between different demands, projects and motivations.

Interactions:

Many of our activities are related to our interactions with others: our network

Crossover between life projects:

Management of boundaries: we have activities aimed at maintaining boundaries between different areas of life, or trying to bridge them.

Knowledge associated with activities:

Tacit and explicit knowledge related to activities. Myths associated with the activities and the institutions.

Knowledge needed to perform activities:

At the level of ICTs:

- Activities using ICTs
- Activities where ICTs currently in common use

- Activities where use of ICTs are currently being innovated
- Communication circles and patterns
- Information work – processing information, finding information
- Education
- Activities were there is pressure for efficiency improvements
- Time hungry activities

3.5.4 Events

Events are particular sorts of activities that take a short time to achieve and stand out as remarkable against normal activities. They normally involve a change in regular or routine activities and have a significant effect, but can themselves be cyclical or regular as well as unique. Appropriation and domestication process events are very important as they often mark important stages in personalisation, in changing attitudes, in making rules, learning and in changing relationships. Events picked up on in the interviews were those that occurred before or during the period of study. Since this was done by self reporting, only the events that they found significant to the questions (which were varied) were reported. However the questioning was designed to reveal a range of events.

One class of events I call ‘life events’. I group life events into two categories, major, those that have involve upheaval, and minor, things that may not involve much change, but can be the opportunity or cause of change. Of course there is cross-over, and with hindsight a minor event could be the cause of major change (a new friendship that ends in marriage, or a new interest that leads to a career or major leisure activity).

Major life events are events that involve considerable material, relationship and symbolic upheaval. They include marriage, divorce, changing job, major injury, moving house, starting and finishing education, redundancy, entering relationship. How these effect different people is of course a subject for other research, but for my purposes, I see them as important trigger events, and the research shows they can have some considerable effect both in the material acquisition of ICTs.

Minor events include minor illness, holidays, buying large items, promotion, making new friends, new activities.

Life events:

Significant events in life projects – often changing points between one project and a new one.

Annual events:

Regular practical and symbolic events that are marked by activities of the individual or shared in their group, organisation. Often mark cycles of life, and can be connected to particular life projects. Some may be linked to a subculture, others drawn from more universal culture (public holidays, festivals)

Network events:

Events that involve the network, these particularly relate to forging or changing relationships.

Boundary events:

The boundary event initially marks the change from one regime to another, but can also be an event that confirms the boundary when it is challenged. For example, boundaries in relationships, domains in life, the start and end of life projects, the making of rules. Often they are symbolic activities marking other changes (e.g. beating the bounds, initiation rites, and special anniversaries). I also include events that become important in defining boundaries, or for breaking them down: e.g. getting a computer that enables work to be done at home, a decision not to get a computer to keep home and work separate, a family decision to limit TV viewing for children.

Appropriation events:

Related to technology events – but particularly to do with the adoption of new innovations, and important events in the appropriation and integration of them.

Technology events:

Remarkable events with the use and adoption of technology, maybe a number of small events that are linked together in the mind of the respondent.

One of the problems of one-off interviews is to try and understand how people change their minds, and when. One model would be to assume that there are specific events or experiences during which people either gain information, or have to make decisions and analyse and take evaluate that information or knowledge according to their values, circumstances, goals, relationships and resources. However, under this model how ‘large’ or explicit are these events. For some people there may be definite times when

decisions or knowledge and attitude formation, affirmation or change occurred. For others there may be a slow accumulation of knowledge, through minor events, or for example, constant use of a technology.

Any event may also only be a marker or a crisis point in some underlying situation, something that is the cummulation of chronic problems, or a trigger that tips the balance in favour of adoption. Equally there may be a decision against adoption. A vaguely neutral or negative position may be crystallised by a particular event. Sometimes it is an event from outside (e.g. the arrival of a bill), or an individual deciding that enough is enough.

3.5.5 BEAN and models of consumption and Domestication

The analysis was helped by linking the BEAN framework to two other analytic frameworks, the domestication model and the consumption model of Holt (1995). By working with these I was able to derive grid indicating a range of issues to look for in relation to how people used and interpreted ICTs both in use and in the process of domestication. Again, these were used as a guide in the analysis of the data, rather than as boxes to be filled in from to illustrate every possible combination.

	Activities	Network	Events	Personal History
Experience (Subjective)	Experience mediated by work, domestic, leisure, social activities	Experience in context of other people – their influence.	Context or trigger for adoption shapes experience	Attitudes built over time and experience
Integration	Integration of ICTs through everyday activities. Meanings through using/doing	Integration in a social space (moral economy) Meanings through sharing.?	Appropriation at a time of change. Integration work time - learning	Personal capacity to appropriate and personalise ICTs and innovations developed through experience (scripts, creativity)
Classification	Classification against other specialities in institutions	Others to classify oneself with and against in relation to ICTs	Bring into contact with new people, obliged to reconsider identity	Attitudes to others v.v. ICTs developed over time and experiences
Play	Activities that are shared around ICT use, maintenance, purchase etc	The people with whom innovations, adoption, use are shared. Developing relationships around ICTs	Shared events	Past experiences of using and adopting innovations and ICTs

Table 11 The BEAN approach and. Holt's consumption model

	Activities	Network	Events	Personal History
Appropriation	Appropriation imposed from outside, or seen as fitting activities of household – from work to media use. Activities enable appropriation (resources, money, knowledge)	Discussion, debate within household, and with, networks outside – enrolling expertise, and resources	Event for whole household – e.g. moving, or for individual e.g. new job, school. Or regular event, e.g. Christmas. Media event	Past experiences of ICTs in the home, and the experiences of individuals appropriating from outside
Objectification	Object brought into the home and placed relevant to activities intended for: work, play, individual or group use.	Debate over where it should be placed, in what context, how it can be moved. Who is in control; Who is expert set. Discussions of new acquisition	The installation event, ceremony, the gift giving event,	Previous experience with ICTs of different sorts,
Incorporation	Integration into the activities in the home, routines of space and time - changes in activities Changing existing routines and activities (e.g. displacement, replacement of activities)	Routines of sharing, Emerging rules of use, disputes over use, sharing, discussion integrated into routines, everyday life. Changing relationships of control, expertise. Tool to challenge or re-enforce.	Breaking points, rule making points, particular events demanding use, decisions to restrict, change use, upgrade,	Attitudes to others v.v. ICTs developed over time and experiences. Pre-existing routines how they fit new acquisition, pre-existing hierarchies
Conversion	Changing boundary of activities. Use of ICT at home that change outside activities (e.g. work routines) bring activities into the home – e.g. socialising in home, electronic or 'real'. Reinforcement of boundary.	Bringing knowledge, attitudes from outside network in, developing knowledge that is translated out again. Attitudes of those outside. Changing boundaries. Others come into to use… Conflict over changing boundaries	Events: use of ICT for/by people from outside. Particular discussions outside home, experiences outside that are brought in, real or electronic.	Willingness to share home experience with outside, pre-existing relationships with outside.

Table 12 The BEAN approach and the domestication model

3.6 Preparative Work and Reflections on the Research Process

In preparing the research, and developing an understanding of the process I would be investigating in others, I reflected on my own experience and everyday life, using a number of the tools from the literature and those I was developing myself. As I developed the research from the original rather

different conception, and noticed a number of issues that would subsequently become important. These tools included keeping a diary of my own social network and contacts, and a diary of my own adoption of the mobile telephone, in the context of the issues raised by the BEAN, Domestication and Consumption models, recording my own subjective reactions and thoughts and learning, the practical aspects of learning and using a mobile phone, particular events, and the reactions of other others over a period of two years (These are given in the Appendix). This gave considerable insights into a personal technology that created ambivalence and crossed over into all domains of life, and into the way I could engage with those I was interviewing, and the sort of issues I would have to investigate.

Finally, in parallel to the formal research, I was continually watching the way I saw people using and talking about new ICTs, and asking for stories, which were usually forthcoming in response to finding out what I was investigating. These stories reinforced what I was finding in the interviews, and in many ways pushed the direction of the research. One aspect was constant trade in ICTs between people, gifts, sharing etc. Second was the importance of individuals who were enthusiasts and earlier adopters in their social networks, who provided resources, help and encouragement for others. This was true for groups of experienced users, who needed someone to keep them updated on new technology, and for novices who needed a first step on the ladder. Third were the constant problems that were encountered, and the stress that went along with the benefits of use.

A number of events also prompted and encouraged my research. One of these was a major trial in the US of an English *au pair* accused of murdering a child in her care. At the time of the judgement the judge chose to put the verdict on the Internet. He did this not out because the Justice Department had instigated it as a policy, but because his son had persuaded him it was an good thing to do. This was a very public demonstration of the cross-over of influence between home and work in the adoption of the Internet.

Chapter 4 The Case Studies

I chose to study four networks of respondents. The First network was also a trial of the method and a practice of the interview schedule and conversation technique. The following are summaries of the four networks. A full description of each respondent is included in the appendix.

4.1 Group 1

The first network, group 1, is a group of 6 people I found through initial contact with an acquaintance Valerie. Valerie agreed to help as favour and I was able to try out and practice the interview with her. Valerie named 5 close contacts: four women and one man. Four are in her family, her parents and sister and niece, and one is a colleague, Amanda. Valerie is a senior teacher in a primary school in a small town near Edinburgh. She is aged 40, and has worked as a teacher for 10 years. Before that she travelled and studied. She has a responsible position at work, and a busy social life. She lives by herself in her own flat in the city. Valerie named her sisters and mother as those she speaks to the most and shares the most things with. At work, her closest colleague is Amanda. Amanda is a younger woman in her mid 20s. She is starting a career in teaching, having been born and bred and educated in Edinburgh. She has a close network of friends she has made and kept over her life.

Valerie's family live two and a half hours drive from Edinburgh in a rural area. After training as a nurse and working in hotels, Fiona, her older sister, with her husband, took over and transformed their parent's hotel into a retirement home. She runs the business largely single-handed as her husband has been ill for 12 years. She has two teenage daughters. She is very active in outdoor pursuits and has many hobbies.

Valerie and Fiona's parents, Mike and Helen, are retired and in their 70s. They are both from Scotland, and were married in the local village in the

1950s. They ran a hotel that they built, after living two years in the Far East. They live off investments and some land they rent to a farmer. Mike has a quiet life doing jobs in the garden; Helen is more active in the local community. Every year they travel somewhere around the world, and have a network of friends from outside the village. Fiona's daughter Laura is 12 years old, and goes to the local high school. Her favourite subject is IT and technology. She has a few friends in the area whom she visits. Her sister Lisa is 16 and goes to a private school in the Highlands. The group is all women bar one, and most of them have little interest in new ICTs, although computers are very much part of their everyday lives.

4.2 Group 2

The second group I found after a search for artists working with multimedia. I thought this would be an interesting group, with the principal respondent being conversant with consumer and creative ICTs, but with an interesting perspective. I suspected that this might also be in a milieu where computers were not commonplace, but where invention and experiment were common. I eventually contacted Andy, who was doing a masters degree in fine arts at a Scottish University, doing his dissertation on multimedia in art, including creating a number of experimental works using computer graphics and sound. When I interviewed him he was working in a small unit in a large higher education college, developing multimedia applications for education. He became the main respondent, and I built the group round people he nominated as important people in his life. Part of that group were those who worked with him in the multimedia design office: Noel, the head of department, Neil, the graphic designer and Alec the technical specialist. I also interviewed Trevor and Nigel who are artists working in the north of Scotland, with whom he had worked for many years. They ran an art exhibition curating company, putting together local and international exhibitions to tour in Scotland, as well as working on their own art. The group turned out to be all men around 40 years old, and most of them heavy users

of ICTs, designing multimedia, researching information, publishing and communicating for work and in their personal lives.

4.3 Group 3

I started to find this Group by advertising on mailing lists for multimedia developers who would be interested in taking part. I wanted to look the environment in which multimedia products were being developed. I had a reply from Maurice, a computer software trainer who was also developing a multimedia city guide/e-commerce project part time. However when I spoke to him in more depth, he admitted he worked alone and had few friends, and suggested that his wife, Ruth, could be the principal respondent. Group 2 had turned out to be a group of developers, so this was an interesting alternative. It turned out that their were a number of similarities with the other groups, with some of the members of the group sharing similar jobs (school teacher, higher education college), and family status. Ruth is in her late 30s, and teaches adults with learning difficulties in a higher education college. She is married with 3 children, and has three grown up children from a previous marriage. She is very busy between her work and family. I interview her and her husband, and two of their children, age 5 and 7. The children are both at school, and keen players of video games on the computer. She introduced me to her parents, John and Dorothy, who are both retired and living in the city. John had worked as a quality engineer in a local manufacturing company, and was currently finishing a degree in literature with the open university. Dorothy had been a secretary for a GP. They are both involved in local church and history groups, including leading tours of a museum. Ruth also introduced me to a colleague, Maura, and a friend, Mary. Maura is about 40 and works in the college with her as an advisor for those with difficulties. She has a family with teenage children. Mary is in her late thirties, and had just had a baby. At the second interview she had lost her job in a special needs school and was looking for new employment. I interviewed

her with her husband, Terry, who is a manager at a commercial biological testing laboratory.

This group included three generations of a family, 3 men and 4 women. They had a range of use and interest in ICTs.

4.4 Group 4

In looking for the final group I noted that most of the people I was already asking were in their 40s and in reasonably comfortable professional jobs. I want to find some contrasting people, especially a group of younger respondents. I had been doing some research in a publicly funded cybercafe in a relatively new public housing project, and this gave the opportunity to recruit a main respondent. I asked two boys in their late teens who were in the café and filled out a questionnaire for me, if they would like to help. Initially I interviewed Ross, who was age 19, and unemployed. He lived with his father, Bob, who had brought up him and his sister after separating from their mother (who lived near by). Ross had left school at 18, where he had enjoyed learning and using a range of IT, and now dedicated himself to playing basketball for a team which his father coached, and spending time with his friends. Ross's team played in a national league and he had also travelled abroad to play. During the research period he had a number of part time jobs. His father Bob was an electronics enthusiast as well as being a full time father and basket ball coach. He was studying electronics at the local university, and looking for paid freelance work in electronics and computer control. I then interviewed one of Ross's friends, Aiden, who was the same age, and lived in a nearby flat. He and Ross had been friends all their lives and were in and out of each other's homes all the time. Aiden had various part-time menial jobs, but spent much of his time with his friends, playing video games, watching cable TV, reading popular science and 'Manga' magazines, and learning to play music with Ross. Neither Ross nor Aiden were interested in the free local Internet access, but Bob was. Unfortunately I found it very difficult to pin down interviews with this group, and Aiden's

family and friends declined to be interviewed, so the group is limited to only three people.

4.5 Some statistics and graphs

4.5.1 Summary Details of Respondents

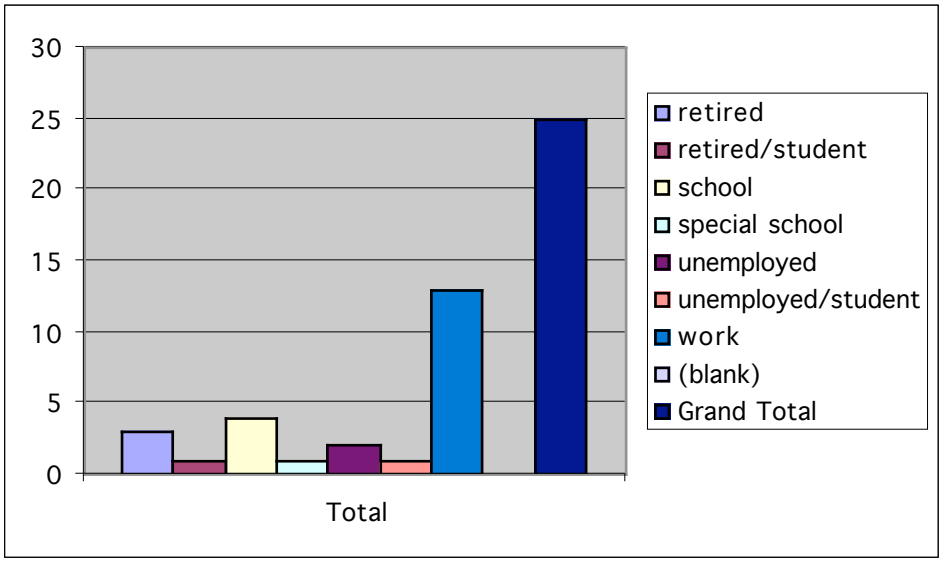
Group	Names	Sex	Age Group	Age	Occupation	Relationship to informant	Children	Married	Computer in the house	Use computer	Loc
Group 1	Valerie	F	40s	41	employed	self	0	0	1	1	1
	Amanda	F	30s	27	employed	colleague	0	1	0	1	0
	Mike	M	70s	72	retired	father	1	1	0	0	0
	Helen	F	70s	72	retired	mother	0	1	0	0	0
	Fiona	F	40s	48	self-employed	sister	1	1	1	1	0
	Laura	F	earlyteen	13	school	niece	0	0	0	1	0
	Lisa	F	lateteen	18	school	niece	0	0	0	1	0
Group 2	Andy	M	40s	40	employed	self	0	0	1	1	1
	Nigel	M	40s	40	self-employed	friend	1	1	1	1	1
	Neil	M	40s	35	employed	colleague	1	1	1	1	1
	Noel	M	40s	40	employed	boss	1	1	1	1	1
	Alec	M	40s	45	employed	colleague	0	0	1	1	1
	Trevor	M	40s	40	self-employed	friend	0	0	1	1	0
Group 3	Maurice	M	40s	45	employed/self-employed	husband	1	1	1	1	1
	Ruth	F	40s	39	employed	self	1	1	1	1	0
	John	M	70s	70	retired/ student	father	1	1	1	1	0
	Dorethy	F	70s	70	retired	mother	1	1	0	1	0
	Terry	M	40S	44	employed	friend's husband	1	1	1	1	1
	Mary	F	30s	38	employed/maturnity leave	friend	1	1	1	0	0
	Maura	F	40s	42	employed	colleague	1	1	1	1	0
	Daniel	M	under10	7	school	son	0	0	1	1	0
	Ben	M	under10	5	school	son	0	0	1	1	0
Group 4	Ross	M	lateteen	19	unemployed/ working	self	0	0	1	1	0
	Aiden	M	lateteen	19	unemployed/ working	friend	0	0	0	1	0
	Bob	M	40s	42	unemployed/ student/ self employed	father	1	0	1	1	1
							13	14	19	23	10

Table 13 Details of all the respondents

4.5.2 Occupation

occupation	Total
retired	3
retired/student	1
school	4
special school	1
unemployed	2
unemployed/student	1
work	13
Grand Total	25

Table 14 Occupation



4.5.3 Age

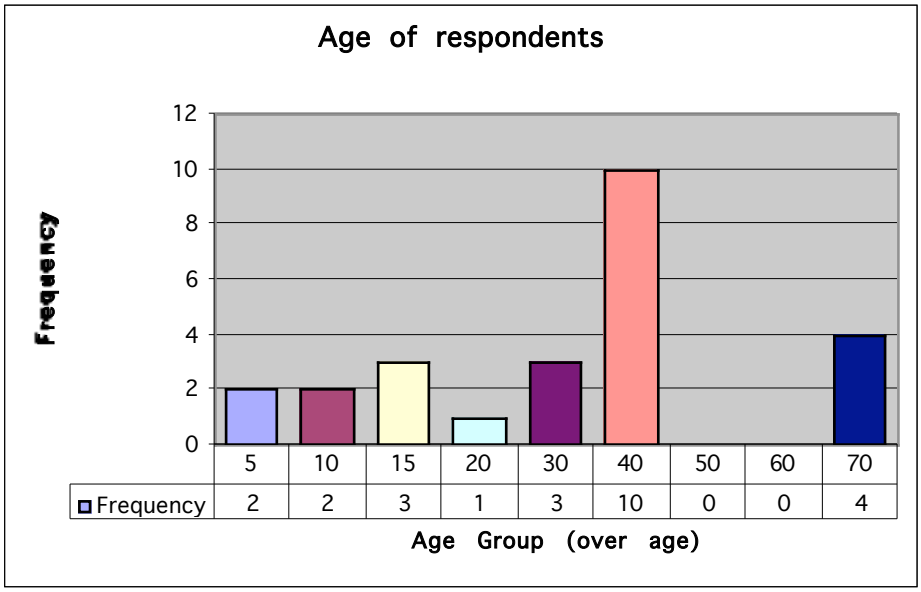


Table 15 Age

Chapter 5 ICTs in Everyday Life: Existing Uses and New Encounters

This chapter investigates the circumstances in which people encounter ICTs, where they find out about them, and where they use them. It illustrates the many ways that we currently use ICTs, and the places, relationships and activities that bring us into contact with them. This includes direct experience at work, at home, through the media, activities related to special interests, and the experiences of others. I introduce the environments in which the respondents in this study used and encountered ICTs and then show the role of the social network in exposing them to innovations. This starts to show how an individual links together, on the one hand, various spatial and organisational domains of everyday life, and on the other, formal and informal networks of family friends, colleagues and other acquaintances. This chapter does not look in depth at the processes of adopting new technologies. Neither does it break down the types of technologies, services or uses into categories. It uses examples of whatever technologies or services people mention. Some may be ‘work’ technologies, others domestic, some multi-purpose, others, specialised.

Many new ICTs are developments of existing products: there are few really original products. Many people are aware of the general class of product for a long time, so it is normally the application or particular form of the technical artefact that is new. Examples include tele-shopping, electronic mail and mobile phones. For years we have seen images of ‘personal communicators’ in sci-fi movies, but with only a remote expectation that we would all have one, since they are just a few of many futuristic ideas that normally never come true. When it appears, the application or configuration can be profoundly different in consequences to earlier generation of a technology or service, a fact that may be immediately obvious, or only become apparent over time. The mobile phone is of course only a telephone, a technology already well integrated into our lives. However the development of the mobile phone has led to a significant number of completely new social and service

features that even sci-fi writers seldom explored. Nonetheless the continuity is striking, and a predominant use of the mobile is as an extension to overcome the limitations of fixed telephones.

The general message is that new product introductions are just part of a continuum, and most people are well aware of past developments, and approach new products with experience and knowledge. So many new products and services are announced and few come to anything. Successful products are often very slow to arrive, but are announced through the media, as prototypes, in fiction and in the military, years before, giving us plenty of time to get used to the concept, if not in actual configuration and implementation.

5.1 Encounters with ICTs

We encounter many new technologies in our everyday lives: at home, work, in the streets, in places we visit for holidays, on business, in public spaces, through conversations and the media. Depending on our activities and network we are more or less likely to be exposed to any particular innovation, and then more or less likely to take notice and be in a position where it makes sense to follow it up. Different occupations and interests make particular technologies more relevant for some people than others since many are designed for particular types of use or organisation. There are also other more generic technologies such as the telephone or the PC that are much more flexible in their use, and can be used or configured by users according to their particular interests and activities.

As well as being influenced by the activities that we or our community engage in, there is a personal component related to the interest in innovations. Some people appear to be more attracted to investigate innovations in general or to particular classes of innovations. A number of questions can be asked about individuals encountering innovations: how likely is someone to take notice of innovations when they encounter them? Is a particular individual the sort of person who looks out for innovations? Is this

purely a personal issue, or does the social situation shape our likely responses to innovation?

Change in our personal circumstance is important in bringing us into contact with innovations. Change often involves us innovating ourselves, as we explore or struggle with a new situation. Adapting to new situations often involves finding out about factors in the new environment, looking for tools to manage change, new activities and relationships, and looking for ways to maintain existing relationships, values, and activities in the face of change. In this case, what sorts of circumstances make it more likely that we will encounter innovative ICTs? Not all innovations are the same of course, and the assessment depends very much on the individual, their values and activities. Some innovations can have immediate and profound implications, such as space travel, others, such as a new computer games terminal are completely trivial and uninspiring to all but a few[134].

As detailed in earlier chapters, Rogers proposes three different sorts of knowledge to do with new products: ‘knowledge of’, ‘knowledge about’ and ‘how it works’ knowledge (Rogers, 1995). Some people hear of an innovation, but for some reason do not follow that up by learning more. Others will find out more about it, either by choice or obligation, and start to know about an innovation. Adoption may occur after this. However reflecting on these interviews, it is would seem that this distinction between types of knowledge, although useful, is a slightly mechanistic explanation of what happens. With increasing visibility of new ICTs in everyday life, and the diversity of products and services, we are likely to gradually become aware of different products, their uses and users through many different channels, even if there is little active desire to engage with the innovation. If the person we are sharing a home or office with is using the technology or talks about it, then we cannot avoid its presence. There can be many different ways of knowing about and having knowledge of. It is perfectly possible to know nothing of how a technology works, but be very well aware of what it is like to live and work with it, through the experiences of others.

These issues will be followed up in future chapters, but help set the scene for the various situations in which people use and encounter new ICTs. Not only do I include examples from those who use ICTs, but situations where people come into contact with ICT via our activities and relationships. Knowing of a product from the television can be very different to knowing of it through a close friend.

There are a number of ways we can come into contact with new ICTs, either directly or indirectly:

- We can hear about them or read about them in the media, including advertising
- We can hear about them through the knowledge and experiences of others
- We can see them in the local environment
- We can be given them to use by an institution, work, or family etc
- We can learn about them and how to use them in formal education
- A particular event brings us into contact with ICTs.

The first three are indirect methods of contact, and the way the adoption process is usually considered as starting. In many cases the first contact can be being actually presented with the product without prior knowledge (4). Formal education plays an important role in introducing new ICTs too, in a planned and controlled way. However we often encounter new ICTs in unplanned way, through contingent events that may involve the other mechanisms, but in a way that is rather out of the ordinary.

In the innovative world of ICTs, there is considerable change in the actual products and services on offer. There is a continual flow of new information and experiences we could be exposed to. How do individuals engage with this? This question will be addressed in later. For the moment I will show the wide range of situations and activities through and in which people encounter new ICTs, based on the list of above.

First of all I look at the different activities of everyday life – work, home life, education, consumer activity, civil life, and community and personal activities – and give examples of people coming into contact with ICTs in these areas

of their lives. Second I look at relationships, and how our contact with other people introduces us to innovations.

5.1.1 Work and Employment

Work appears to be one of the predominant ways that people come into contact with new ICTs, often by actually being given them to use. ICTs have been introduced into nearly every domain of work, and into many organisations. The telephone has become one of the main work tools, and the mobile phone has extended this for many. 'Work' is an area where information and communication are often at a premium, and the technologies are way of increasing or improving information gathering, access or control, of improving communications, and for production of 'information' product. Most implementations of ICTs have been in work environments – the local area network (LAN), main frame computer, the PC, enterprise data systems, EDI, generic applications such as word processing, spreadsheets, databases and design packages, and applications for specific functions and industries. More recently many industries are finding themselves increasingly valuing the information they product, and circulate, and oblige many employees to co-operate in formal information gathering and sharing systems.

Whatever someone's occupation, they are likely to encounter least some ICTs. The workplace is a prime site for adoption of recent technologies, such as the multimedia PC and the Internet, although certainly not so dominant as for earlier generations of computer technology. While some people have had ICTs as an important part of their working environment for a long time, others are finding that is arriving now, with a computer landing in the office or desk top of many people for whom it is otherwise an anathema. Hitherto primarily those in technical jobs or bureaucratic administration might have been expected to deal with ICTs, but now few organisations operate without a plethora of business technology available to all.

In the study I found that the workplace was the main area where people came into direct contact with new technology, even if they had not heard of it

there first. Of the 24 respondents, 17 were engaged in paid work, and 15 of those encountered new ICTs in their everyday working life. In general all the respondents were aware of personal technologies such as the Internet, PCs, mobile phones, etc. Many had been using with them on and off for many years. In specialised jobs people were exposed to technologies related to their tasks and organisation. Many of these organisations had been computerised recently. One example is the medical laboratory, where test machines and data logging had recently been computerised (Terry, group 3, interview 2).

A particular industry that is represented in the study is the education sector, where computers are now common in schools and colleges. Computers were introduced into schools in the 1980s in the UK, so teachers of whatever age are familiar with them as a specific taught subject and increasingly as a teaching tool, in some disciplines (mostly scientific and technical), and age groups (primary and secondary). However in the past few years the hype of the Internet, and the arrival of multimedia machines targeted at all subject areas called for an relearning and reassessment of the place of computers in their classrooms.

Two primary teachers in the study Valerie and Amanda (group 1), who otherwise had little contact with computers, and preferred to avoid them in their private lives, had to use stand-alone computers at work, with CD ROM teaching packages and software for children, during the period of the research they were obliged to start using special software for writing reports. In fact they have access to and use media technology extensively:

> Amanda: Video we have, BBC computer, Apple Mac, listening centre. We have a Camcorder in School, but I haven't actually haven't used it yet.
>
> James: Do you use the TV a lot?
>
> I use the TV and the video a lot. I video all the programmes to keep then in, like a video programme on last time to use this term, I find that quite useful. or in another year. So I use the TV and the video a lot. The Apple Mac I use.. I have it switched on, I have some child on it, at least one a day. I don't use the BBC [microcomputer] as much anymore, which is a shame, because it is still quite useful, but the Apple Mac seems to have taken over. Amanda group 1 interview 2

However their workplace also excluded them from using and experiencing many new ICTs. The school had no money for a network, or Internet connection, and there was certainly no need for current mobile communications.

Mary (group 3, interview 2), a special-needs teacher, had not had to dealt with computers, and they were not a part of her job, but in looking for a new job she discovered that computer skills and competence were on the agenda for recruitment, and she started to realise that she had to do something about it. Her friend Ruth (group 3 interview 1,2) also had computers and e-mail introduced into her office, but was not obliged to use them, she could pass off the tasks to a competent colleague. She had a go at using the Internet as well, by the second interview, and by then many of the students had access.

> I have used it for the course, another colleague and I wanted to find out who the Beattie Committee were, so we tried to surf the net, but we didn't find it. Sometimes I've been less than impressed because of the way the key words can work. If you don't know what it is... it's not the answer to everyone's problems. The applications I hear people using most often are projects for school for the kids. [Ruth group 3, interview 2].

Another colleague Maura (group 3, interview 1 and 2), in the same college, was very happy to start using a computer when they were introduced, indeed she had to demand a new one. She also came across the Internet when she was moved to an office with a connection and was using her spare time to find out what is was about.

Fiona (group 1), who runs a nursing home deals with the technical resources all the time but is in no particular need of productivity enhancing information technology. As her own boss, no one is going to impose it on her either. This does not mean that in the course of her work she does not come across multimedia innovations. While getting a brochure made for her business Fiona found out about computerised desktop publishing:

> Took a film, developed the pictures, gave him the pictures I wanted scanned so he just laid this picture on the scanner and scanned over into the computer and then it was printed onto a page and we moved them around. We wanted that one there and this one there and em, printed it all out and then I took it to the printer –[Fiona, group1 group interview 2 G1 : 704 - 704]

Trevor and Nigel (Group 2), who work in a relatively remote area have also discovered new ICTs though work. Desk top publishing, electronic graphic design and e-mail saves them a great deal of time and money and enables them to do many things that would probably be impossible otherwise. Trevor (group 2, interview 1) used computers in his first job in a bank, and quickly took up e-mail and desktop publishing when he moved to Scotland from London. Nigel (interview 2), who had hitherto avoided many ICT technologies, lives in a very small caravan on a remote Scottish hillside, and reluctantly manages to cram in an Apple computer and fax machine.

Their friend, Andy (group 2, interview 1), who wanted to explore sculptures that use sound turned to computers as a possible way of putting it into practice, that led on to exploring multimedia as a creative genre for his work.

> Because I needed to do the sound one [artwork]. And the only way I could think of was doing it at the digital level. So I went on a course… That was 1990 and I saw introduction to computing. And also I didn't know how to switch on a computer. I didn't know anything about computers at that time so it was like, quite literally, feeling like a dinosaur. I really felt, you know, put me in a better situation for the jobs market and also get introduced to it so that I could possibly get the sound block done digitally. So that I could do it myself instead of paying large amounts of money to other people to do them, which obviously they can't do anyway 'cos it's just like the equipment's not there. Andy group 2 interview 1

He does his artwork at home, and has his computer in the living room, as well as using computers at his paid-work place. When Andy moved to his new job in a College of Art he found everyone using computers:

> “There's a lot of people, most folk are very competent in one or two packages. Ian is very competent with Director. I think just about everybody is fairly competent with Photoshop, because every artist who's worked with electronics, Photoshop is the major electronic software for any artist.” Andy group 2 interview 2

In the office of Group 2, the educational technology team are continually adopting new technologies. In general they choose what they need from the market, but the market and evolving technology and ideas about applications imposes technical change on them. They develop web pages, multimedia packages, set up distance education projects, and use the Internet the WWW and First Class[135] to find out information and communicate in their development projects.

Maurice (group 3), who teaches Unix and Java systems to companies, is also obliged to keep up with changes in technology to keep his job and is continually learning about new innovations. He also is developing a multimedia product himself and is constantly scanning for new ideas and innovations. Since he travels away for weeks at a time teaching, Maurice was obliged to get a mobile phone to keep in touch with his family. At home he has a small office with 2 computers and Internet connection, a fax and telephone, and piles of magazines and books on computers.

Terry (group 3), works in a biotech company, where new technology is very important, from chemical analysis to international communication.

> Where you've got a situation where something may crop up em, and it's quite critical that you discuss this with the client but there isn't the time to get everybody together to sort of fly over to see them or vice versa and so it's actually quite useful. And also that our parent company is a global company so we do communicate with email quite a lot but occasionally it's useful to actually discuss things using this video link as well because you've got something physical to actually show them and talk about.

Those interviewed also knew others who had come to use the ICTs through their job. For example, Terry (group 3, interview 2) spoke of a friend taking up using a computer to do word-processing.

> Well no, in fact I do know what he use it, he was asked to write a chapter for a maths textbook fairly recently and he's used that PC for that. He said he found it invaluable. He said if he had to hand write it and get it typed it would have taken him forever. Terry (group 3, interview 2)

The workplace and work activities give many people resources and the opportunity to exploit new ICTs, just as they use many other technologies, either as the basis of the work, or to try and improve their productivity, quality of service. The workplace also gives people a change to explore the on-line world for information and services not related to work.

5.1.2 Education

Another important arena for hands on contact with computers, multimedia and the Internet is by undertaking formal education. Schools, Universities and Further education colleges have had the teaching of information technology on the curriculum for many years, and it is in these institutions that many, particularly younger, people encounter ICTs. Of the 24

respondents, 9 were or had been in education very recently, and all had encountered new ICTs, especially the PC and certain applications, and been taught how to use them.

Lisa and Laura (group 1, interview 1 and 2) attend a private and a state school respectively in Scotland. Both have computer studies and business studies courses where they use computers and the Internet, and learn many basic skills. Laura, when she was at primary school was introduced to videoconferencing as part of an experiment to connect small highland primary schools. Now in senior school she is learning about all aspects of office software, multimedia packages, but not yet the Internet. At Lisa's boarding school use of the Internet is not restricted to educational subjects. There are many foreign students, and they use e-mail to write home, and she was allowed to use the Web to do some research for a holiday to Africa. Ross and Aiden (Group 4) had both left school recently where they had used computers extensively, but were now unfortunately enable to access the facilities.

It is not only children that learn about computers in education. Retraining and later life learners find that returning to study means they have to deal with new technology that is now common place for the younger generation to learn. As mentioned above, Andy the artist, was unemployed and took a course where he come across the Internet. He was interested in sound processing, it got him into the world of multimedia:

> When I was in the multi media course. We did the multi media and we did html and we were sort of like told to surf the Internet and see what design things are. [Andy Group 2, interview 1 : 719 - 719]

He then did a Masters of Fine Art a Scottish art college and was able to do his dissertation on interactive art and develop his ideas of 'active' art. He used various graphics and multimedia packages to create an experimental interactive artwork.

John (group 3, interview 1), when he retired, took an Open University course, and found he had to write essays on a word processor. He had spent his life

as a test engineer in an electronics firm, but even so it was a struggle to go to classes at a local further education college and sit at the back of a class of young people learning WP skills. His daughter-in-law, Mary (Group3, interview 1 and 2), age 40, who was sent on a higher education course from her work, also found she had to submit her essays word-processed, which made her face up to a technology that she had always ignored, despite the house being full of computers. She soon found the best way to deal with it was to get her husband Maurice to do the typing for her. Bob (Group 4, interview 1 and 2) also went to University in middle age to do a degree in electronics and discovered a wide range of information technology which he studied and used in his studies. He was introduced to the Internet which he uses from the University and local cybercafe for his work projects.

5.1.3 The Home and Domestic activities

At home there are less opportunities to experience new ICT technology and services directly without someone in the home making the choice to go out and bring them in. However with the development of communications technology the telephone and the Internet are bringing many new services into the home space, and in the last few years it has become possible to have access to information services, databases and communications that either have never existed, or only been available in organisations. Common technologies physically in the home were the home computer, mobile phone, the Internet, computer games, home banking terminal, cable TV receiver, VCR, answering machine, the telephone, and electro-mechanical household technologies. Internet and phone services are innumerable, although at the time of the study they were only trickling into homes. These include home banking, advanced domestic telephony services, pay per view movies, Internet book and CD shopping on the Internet, e-mail and access to Internet based information services on the World Wide Web. At the time these were in there infancy. The home is also a place for heavy media use, and for discussion of the activities and relationships of family members, both inside and outside the home, which may often cover ICT use and knowledge.

Those people who did work at home had office technology in the house, and it became part of everyday life for all the household. In these cases the work computer was often kept in an office in the house, rather than in a more public room, therefore was not in full view (Aune, 1996). Fiona (group 1) had a computer in their house which all the family used. Terry (group 3) had a computer in the spare bedroom, which his wife was reluctantly trying to learn to use. She was not too pleased with him spending too long on the computer at home though. Maurice (group 3) has a whole home-office and moved one of his computers to the children's playroom, as well as having a home banking terminal and 2 mobile phones. His children and is wife have all encountered the technology first at home and through their domestic life, although most of it is kept away from the children in his office.

> "because Maurice is working on that I don't have a, I have not had until the kids got one downstairs, there's not been a computer in the social space in the house. It's been Maurice's working computer. Em, and I have thought that I mean if that one was just sitting there and he didn't have his own stuff all carefully shielded from prying hands I might sit and play with that of an evening and do things." Ruth, group 3, interview 1

Ruth's mother, Dorothy had got as far as learning to use an electric typewriter when she retired from her job as a doctor's receptionist, but computers came into her life when her husband John started studying, and bought the computer. Now he uses the machine constantly, discuses computers with friends and family and she cannot avoid it. Trevor (group 2) who built up his art business has all his machines in an office in the house, and thus brought the technology to his wife who also works at home. His friend Andy (group 2) has his computer at home in the living room, in fact there was not much space for his chairs and television – the whole room is dominated by the computer, and piles of magazines, disks and books.

Television services are the most likely to be used and encountered in the home. Aiden and his family connected to cable television. Through this they have access to multichannel television and were introduced to pay-per-view movies. Their neighbour Bob (group 4) also bought cable television where his children where younger, but now they are older he no longer subscribes.

Teletext is an interactive service that has been on UK televisions for about 20 years, and is well used, but many people are still only discovering it now. It comes as an ‘add-on’ to the TV, that people only encounter as a result of buying a TV set. Helen and Mike (group 1, interview 1) bought a television and she uses the teletext service on it. Aiden (group 4) bought a new TV that has teletext, as did John, but both have problems with it.

Many activities such as hobbies and community activities bring people into contact with new ICTs. Most directly of course is when that hobby is the technology itself. Alec had always had an interest in electronics that he developed with his father, and over the years this had turned to computers, and he had built and used computer technology, both hardware and software from almost as early as it become available. He was later to turn this into his career. For other people it is incidental to another activity. Fiona, though her mountaineering came across GPS navigation aids, and the club Web site where members were supposed to post details of climbs they had done.

5.1.4 Shopping, Personal and Citizen Activities

There are many essential activities that take us out the home and out of work. Shopping of course is important for many people, but we also have to do banking, go to the doctors and dentist, deal with the government in various ways, use public transport and private transport facilities, deal with schools and other groups as parents, and many more things. Many of these organisations we deal with in this way have been computerised and are probably the places where we experience major information systems most frequently.

> I know that a lot of the systems are all computerised and I've noticed that when you go into the doctors that there's not, your files not there anymore, it's all up on the screen. Everything's on disk in the computer. But I really don't know too much about the medical side. I know that nurses have said that their job's more technical than it was. [Amanda Group 1, interview 2: 348 - 348]

Thus even if we do not work in a computerised organisation, we are still able to directly see and experience large scale organisation information technology systems.

There are other types of IT system visible to the public as well. In Edinburgh, the new museum is a place to experience multimedia terminals for John and his grandchildren:

> "In the new museum they have some very interesting, well laid out touch screens. Have you heard the guillotine? They have a touch screen in the front of it. A Scottish designed, Edinburgh made guillotine. On the touch screen if you push all the right buttons you can put your finger on the trigger and the blade in the picture roars down and you hear it. The kids love it!" John. Group 3, interview 2

John also notices terminals while travelling:

> "I noticed out at the airport that you can check yourself in if you haven't any luggage. Like these automatic ticket machines in railway stations." John. Group 3, interview 1

Supermarkets with the barcodes, scanners and loyalty cards are another place where we use and watch technology develop:

> "I think probably more and more the shops use computers at stock levels don't they and the big supermarkets in particular. ..this is going back a bit with bar codes and they run through different stock levels. They're sent down south or something and it's all automatic re-ordering." Fiona, group 1, interview 2

She also has a card for her local supermarket, and has noticed that there are more and more services it can be used for

> "Yes, I have a Tesco card. Yes. Quite useful. I think eh, well they've got different ones now don't they. They've got the basic one and they've got one that you put money in every month and you use that and then you've got another one so that you can save, so you've got three sets." Fiona, group 1, interview 1

In shops we do not have much choice about use of technology, just accept it, some more than others. Andy (group 2) has a loyalty card in his wallet just because the supermarket gave it to him for free.

> Do you have a loyalty card?
>
> "Not for anything other than it was free. I don't think I'll ever get enough points to get anything worthwhile. I don't spend much in Sainsbury's."

One UK supermarket gives shoppers like Maurice even more technology, and takes even more information:

> "because I've got this loyalty card and they know about every single purchase I've ever made and they've got me down to a T because they're all about doing this self scanning stuff and you get a thing like that so you just stick the stuff in these wee boxes on the trolley, you don't have to check it out. So I mean it's absolutely brilliant. So there's technology in action. " Maurice, group 3, interview 1

Shops can also expose us to many new consumer products, but whether we take it in depends on our shopping habits and general interest. However this turned out not to a particularly important point of exposure to new ICTs, but they are available for consultation when some first hand information is needed. Alec for example, who is a self-confessed technophile will go to shops to find information about a product he is interested in buying:

> Either magazines or I'll just go round the shop and hack around until I get the information I need in a leaflet. Well I've discovered they don't like printing the leaflets for items nowadays. Alec Group 2

Many people have a bank account and know about, or use, services such as cash machines, telephone banking and Internet banking:

> “the Bank keeps sending me details about their 24 hour banking and phoning (Amanda, group 1, interview 1).”

In one area where the members of Group 4 live there is a cybercafe. It is the only café in the middle of their house estate, and is well known even if it is not used by many of the population. As well as offering games and Internet access it is a subsidised café and many children and adults go there just to eat at lunchtime, alongside the computers. Bob uses the Internet here, and sees he see other users using different services that he is not interested in, especially chat.

5.1.5 Encounters though the Media

Media use is an important activity for acquiring knowledge about product and use innovations, and it is though the media that it is possible to become aware of many innovations, and other people experiences and assessments of them long before they touch one’s own life directly. New ICTs have been extensively covered across media, and there is a great deal of advertising for consumer products such as Internet access, computers, mobile phones etc. Different programmes, magazines and newspapers give different coverage, depending on how they view their audience, and, thus exposure to ideas, endorsement etc will vary (McQuail, 1969). People use media very differently, and take notice of things in different ways: it is quite possible to

ignore or be unaware of much media coverage of a topic if one is not interested.

The study asked people about their media use, what newspapers and magazines they read or came into contact with, and their TV, radio and Internet use and also use. There was a wide range of engagement with the media, both general and specific to interests or profession. Some people hardly take any notice of the media, do not read newspapers, watch television or listen to the radio, others are self admitted information junkies, reading and watching all the time. The reasons for this range of engagement with media are various, and will be discussed later. Most people are fairly selective about what they consume, and some, such as the two sisters, Valerie and Fiona (Group1), have quite negative attitudes about 'wasting time' with electronic media especially television, despite being keen on getting information from other media.

Advertising campaigns for multimedia related products and services are one source of exposure.

> Em, I noticed the Intel Pentium 3 processor's coming out which is, because I always said about when the Intel Pentium 2 processor was out on the adverts I used to always have a wee sort of joke you ken, "och I'll no bother getting a PC because by the time I save up for one the Intel Pentium 3 Processor will be out" and now it is ken. [Aiden group 4 interview 2 :358 - 358]

Prime time TV advertising obviously raises awareness among heavy TV watchers like Aiden. However Aiden missed extensive advertising in the local paper for a Web TV style device. Fiona (Group 1) is not particularly interested in new technology, but is still vaguely aware of developments though the media.

> …but they are a lot of new innovations I gather in the computer world, whatever they are selling, it tends to be what you don't want as there is something better coming. you could go on for ever going on for something better. But I think there is a whole new system coming it, it is a new set up, a new more information on the disk, I can't remember. I think there was a big selling campaign over Christmas (1996), there were a lot of old computers, outmoded ones, holding up some new innovation coming in Feb., March, so I am told this is what they are waiting for. [Fiona, interview 1 Group 1 : 342 - 342]

General news coverage of major product launchs can get though to people who watch or listen to the news. The launch of digital TV for example, got

considerable coverage as it is a product promoted by the television companies. However as Amanda (Group 1) points out, the advertising messages are not at all clear to a non-specialist.

> They were advertising quite a lot. And I didn't understand at all what it was at first. I asked my uncle about it actually because I was interested because they were talking about clearer pictures and all this sort of thing. I didn't realise you had to buy a completely new tube set and everything but they're saying that once say that telly blew up we wouldn't even consider buying another one like that. You'd buy one that's got the gadgets. [Amanda interview 2 Group 1 : 222 - 222]

The newspapers have been picking up on stories that involve the Internet and other technologies for a few years, and these appear scattered throughout the paper, in business, news and technology sections. People can pick up on individual news items or just become aware of general developments through scanning the paper.

> Yes, there was an interesting article about I think it was bed and breakfasts and a small bed and breakfast in Scotland how they'd advertised on the Internet and the amount of custom they had got through that and the article went on to explain about the benefit. I suppose it was a promotional article in a sense but the benefits of advertising. It was quite an interesting article. That was in the business section not the IT section. [Maura 2 G3 : 355 - 355]

> Yeah, I've heard - I've not actually come across it myself because I don't use the Internet but I've heard of that. Roughly what I understand you can practically just about buy anything over the Internet. Get instructions to make bombs and things. [Aiden 2 G4 : 418 - 418]

In general, the media made people aware of innovations and helped them ‘know of’ certain products and systems, but failed excite much interest, or provide a very clear image of what was being developed. Reports of other technical innovations, such as biotechnology and medicine, seemed to leave a greater impression.

A specialist with interest in the field, such as myself, may have felt that the media was full of information on ICT innovation at the time, but many of the respondents hardly noticed it at all.

5.2 Social Network

Our own experience and activities are not the only way be come into contact with new technologies. We experience it vicariously through our network and through the media. In the previous section media use was seen as an activity

that exposes us to innovations. Here I look at the role of the social network. We experience others integrating ICTs into their everyday activities, and undertaking new activities based around technology[136]. We also share learning and adopting with others, to different degrees, according to the situation and individual as well as the product. The importance of an individual's multiple social relationships or networks is one of the key themes of this study. I divide these relationships into everyday sociological groups – work colleagues, friends, the family (nuclear and extended) and acquaintances through other community and personal activities, although these relationships could be divided in other ways such as voluntary relationships and imposed relationships, everyday or occasional relationships etc.

5.2.1 Colleagues

Colleagues at work are an important source of information and experiences of new technologies. Organisations investing in new systems create the conditions for shared learning, and for local experts to advise colleagues. In a work situation involving the use and development of multimedia products, discussion and experimentation are generally going to be much greater than in an organisation where the technology is an additional tool and facilitator to the principal tasks and relationships. There is also a place for cross-company links with colleagues in other enterprises.

Alec [(Group 4), the technical specialist in the college, uses his existing network to learn:

> "Yes. I mean over the years, I've kept track of what other companies are doing. I have contacts and I've still got contacts in all of the colleges, around Edinburgh anyway, and beginning to pick up contacts in medic and other places." [ALEC 1 G2 : 148 - 148]

In fact the distinction between friends and colleagues is quite loose between organisations – Alec's personal network is a quite heterogeneous:

> Yes, I've got quite a good circle of friends and contacts, all from different areas of technology. Again, measuring up trends, what we think of new technologies coming along. It is a kind of technology watch. The technology affects different people in different ways, the way they work or are developed. [ALEC 2 G2 : 129 - 129]

Nigel, the techno-resistant artist, would have been quite happy to ignore computers, but for his work with Trevor:

> Well we had a conversation about eh, I was doing everything here for work more and more and more. He would type things out on his typewriter and then bring them here for me to do on the computer. and it came to the stage where we were really on lift off point and I just said to him "this has got to stop. I am not doing this, I can't do this, we can't do that again." I said "Nige, you're going to have to get a computer, two of us need to be working on this." And he said "I had a horrible feeling in the pit of my stomach that you were going to say that." So he incredibly reluctantly got this computer. [Trevor 1 GR 2 : 423 - 423]

The relationships at work can also be with managers, clients, students and others who share experience and ideas, activities or an organisation. The contact with ICTs may be separate from the work relationship, and come up in conversation about something else. By the second interview Fiona was getting into conversations with others about the Internet, such as with the man preparing the brochure for her business.

> I think Mike was talking about that [Web Publishing]. He's the lad that I was talking about with setting up pages on the Internet, Internet selling, he's all set up a page, got a local photographer Dennis Hardley, he's got some wonderful Scottish scenes and he's going to sell his Scottish scenes, photographs over the Internet so he's setting up pages with a selection of them so.

Andy made use of this colleagues, such as Alec, to help him learn about computers. He was also trying to get someone in the college to write him some software[137]:. Valerie and Amanda who work in the primary school work with the children on computers and through this they find out about the applications they use, who has machine at home, how they share them and who is missing out.

5.2.2 Friends and Family

Discussions between friends can bring up experience of ICTs both at work and in other domains. In particular, some of the men spoke a great deal about computers, while the women avoided talking about them, and switched off. For example, computer are an important talking point for Andy and his friend Trevor – when I went with Andy to meet Trevor that was the topic they immediately launched into. In contrast, Dorothy and Fiona both switch off when their friends and family start speaking about computers.

Amanda has a network of friends in a variety of professions, who discuss their work a great deal. Many of them have computers and talk about them, although it makes her switch off, however home computers are not common[138].

> I've got the odd, a few friends who do have a computer but ... his friends but - and my friend Jonathan who's a doctor, he's always can be found in his wee hole on his computer. You know, and he does, I mean if him and Ewan get together you know, just talk about the latest game or whatever. [Amanda2 G1 : 220 - 220]

Amanda shared a flat with an avid computer student, and this exposed her to the Internet and other aspects of a home PC she may not have otherwise have seen.

> Ewan input photos onto his screen and copy them and have them on screen. He's done that with photos he's taken before. [Amanda2 G1]

Neil (Group 2) was a regular Internet user, but still learnt about new ways it could be used through friends and colleagues,[139]. Both Valerie and Amanda, the primary school teacher note the importance of childrens' friends in getting access to home computers.

Friends can share lots of things about how they are coping with work, and the adoption of new ICTs are no exception. Terry and Mary (Group 3) even find themselves taking about computers with their least technophile friends.

> Mary: I think quite a few of our friends on the Internet and send emails and all that. I mean I would say most of them are because all our friends are professional, aren't they, so they're all using.
>
> Terry: Yeah. I would say that we're exceptional that we don't - there's only one couple I can think of that might be more backward IT wise than ourselves and that's only because they don't have a TV.
>
> Mary: Who? Oh Brandon and Susie. Yes they still eat lentil soup.
>
> Terry: Having said that, they have got a computer with a CD drive and it's on the Internet.
>
> Mary: Brandon has. Susie -
>
> Terry: Susie doesn't use it much but he certainly does. He's a maths teacher.
>
> JKS: Oh right. So he uses it for work or just -
>
> Terry: I don't know what he uses it for to be honest.
>
> Mary: ... probably.
>
> Terry: Well no, in fact I do know what he use it, he was asked to write a chapter for a maths textbook fairly recently and he's used that PC for that. He said he found it invaluable. He said if he had to hand write it and get it typed it would have taken him forever but he found that using the PC is great because he's got a package on there that's got maths formula in for example. He's found that quite useful and he sees this as another

> way of making a bit of money because there's going to be a whole series of these books coming out. So he should actually cash in on it. Susie his wife who's not that IT orientated, I think it won't be that long before she gets sort of interested because she's a botanical illustrator and em she could sort of scan some of her work directly into some sort of presentation. (Mary and Terry 2, Group 3)

However, although most of their friends use e-mail, they do not talk about ICTs very much. Some friendships are not always sources of information and sharing experiences. A particular social circle or relationship may not facilitate sharing, may restrict access to information and experiences, or they may avoid the subject in conversation. Some people it is a ‘boring’ topic to be avoided in outside work.

> Well Mary Dewarcatch does a lot [talks about computers], she was a colleague but I mean I socialise with her sometimes so she's a bit of a friend. She's not ... it's just once a week. No I don't tend to be attracted to those kind of people, I think my friends are probably quite similar to me. [Mary+Terry 1 G3 : 1283 - 1283]

Maura is quite keen on using her computer, but does not talk about them outside work:

> James: And do you have any friends who've bought computers or anything like that?
>
> Maura: Not that I'm aware of, no. I mean most of them had computers already.
>
> James: Do you ever talk to them about it, about them? Or is it something you -
>
> Maura: No.
>
> James: Ask advice?
>
> Maura: No. [Maura 2 G3 : 195 - 205]

Valerie is similar:

> Valerie: Some of the people who work with computers in places like Ferranti, and people doing research of different kinds. Mainly the people I know.
>
> James: Are they good friends?
>
> Valerie: Not the close friends, no, friends
>
> James: Do you ever talk about it with them?
>
> Valerie: No, just in a general sense, about how they are getting on, how things are going, not in the technological terms. [Valerie 1 G1 : 695 - 699]

By her second interview, she was beginning to hear people talking about the Internet more:

> James: Do you notice people talking about it more, been more on the TV?
>
> Valerie: No. When I hear about it, it's usually through people who have more access to ... technology, and talking about using it. But not roundabout me. Apart from more cafés opened up with computers that can use the Internet and so on. [Valerie 2 G1 : 513 - 513]

Valerie has seen friends using a digital camera, and this interests her, and has led her to find out a bit more.

> I've noticed people, friends, using the digital cameras, had a look at them in shops which seemed very interesting, a good idea. [Valerie 2 G1 : 257 - 257]

Her sister Fiona is the same, as she starts to hear more and more about new ICTs:

> I think probably all my friends, one or two of them, one in particular, she works, she's got her lap top and she works with computers, she's involved with teaching and she's involved with the university down ...London working with ophthalmology and teaching so she carries her lap top round. She talks a lot about it and I'm afraid I switch off. [Fiona 2 G1 : 97 - 97]

Dorothy [Group 3] is an older person, and mixes mostly with older people. As she says, they are generally not users of ICTs, with exceptions, and discussion of them is not really part of their relationships.

> Not really. No, mostly our friends are retired. ... has got one in Glasgow but there again she uses it mostly as a word processor. No it isn't a big part of, I would say, the circle that we have. I think we're all just that wee bit older. Oh some of the male members of the church have computers and things like that but em, not.[Dorothy 1 G3 : 560 - 560]

The family is clearly an important influence on new technology awareness. Much research has found the home to be an important influence on computer and Internet awareness for adults (Rogers, 1985; Katz and Aspden, 1997). For example, a 1997 study (Guardian 30 Sept 1999) claimed that the one of the most important predictors for Internet use was the having teenage children at home. Children in these cases are important, but whatever age they are, 4, 14 or 40. Other family relationships are important sources of knowledge, experience and contact. Partners and siblings having computers or mobile phones, or using and buying technology at work; children using games and computers at home; with friends and at school; parents buying products for children; children telling parents about new technology etc.

Aiden lives in a household where he, his father and his brother all have computer games consoles and television:

> My dad's got a Nintendo 64. He got that just before Christmas. Because we used to have a NES, the old Nintendo, years ago it was a NES and em, one of the games for that was Griselda 2 Link and my dad that was his favourite game back then so the Nintendo 64 came in, a big thing about Zelda Links "OH I'll have to get it." So he's never off it. He's still playing it, he's been playing it since Christmas time. [Aiden 1 G4]

Amanda has an uncle who is her reference for new domestic ICTs, and with whom she can discuss innovations and see the new products he has bought.

> Oh he's had it [cable TV] for ages. He's one of these sort of people who gets everything when it comes out. He's got a huge long like screen and three video recorders and got cable and he's got all the surround sound and everything. [Amanda2 G1 : 124 - 124]

She had seen advertisements on the television for digital television when it was launched, but did not understand it, so he asked her uncle who tried to explain. It is quite common to rely on someone else in the family to find out about new technology. This happened in Fiona's family. They wanted to buy a new computer during the 18 months between the interviews, but Fiona relied on her husband to decide which one[140]. Fiona is aware of the importance of computers to her daughters, and knows that they are using them a great deal at school.

> The young ones they, Laura, she's into all sorts of computers from games to messing around with computers as well. The youngest one, Lisa, she's talking about, she's to do a computers studies sort of work study before she goes back to school so I've just been talking to my brother on the phone in the shop because I think that would be an interesting one for her to do, to go in and find how he uses computers in his workplace. So that's what we were just talking about before you came in. [Fiona 2 G1 : 117 - 117]

Fiona and her husband approve of computers, but not too much of video games, but luckily for Laura her cousin has a console:

> We have always gone out for our way not to [get a video game console]. Laura has a cousin who has got one, so she goes and plays. [Fiona1 G1 : 328 - 328]

John and Dorothy [Group 3] are kept in contact with developments in the Internet and computers by their family, especially her brother Eddie and their son-in-law Maurice.

> Oh yes, very much so. He's an amateur, but he knows a great deal, he's got great pals in Eastbourne. He has a friend who makes a living by operating various financial statistical services for a chosen few clients. Eddie gets a down-load from him and any problems he just phones him up. I try and do the same thing with Eddie, but the snag is that I am so delayed, retarded and he's so advanced, that half the time he can't understand what the hell I'm talking about. However, he does a percentage of time say, you don't do that, you do this. [John 2 G3 : 46 - 46][141]

Dorothy, in particular, does not use computers but hears about them all the time:

> Yes, I'm afraid so. And if you don't have a computer apparently you're out of the picture all together. The children all seem to have computers, they all seem to know how to master them. I'm still waiting for my first lesson that they promised me up there. The children

were always going to show me how to do it. and they're so busy playing that em, "You just do this" and of course they won't move out of the way and let me go at it at all [Dorothy 1 G3 : 512 - 512]

Dorothy is also introduced to 'gadgets' by her husband. And finds she has more than her other 'lady friends' just because of his interest.

James: Why do you think you've got more gadgets [than your friends]?

Dorothy: Well I use them more and my husband likes gadgets. Not that he uses them, he doesn't use them but he likes the result when I've used them.

James: Oh right. so does he say "why don't we get a microwave" or "this might be useful"?

Dorothy: Oh yes, it was his idea to get a microwave. I had never had one, I didn't know if I wanted one. Now I would be very sorry to part with it and we got one that does, it's a combined one, it's not just the simple one. You can bake in it.

Andy and his brother in law Jim talk about computers – he brings talk about computers into his sister's house, whether she wants or not!

I mean Jim and I are always talking about computers and Caroline'll go 'oh boring, they're talking about computers again'. So I don't know just how much she's into computers but I think she is, she uses the computers at school

Through our social network we hear about and see ICTs as much as through the particular activities we do. Our social network brings information and experiences across boundaries into different domains of activity and into apparently separate parts of our lives.

These examples make it clear that dividing up the network into friends, family, colleagues and so on is an artificial division. The boundaries of life are permeable when it comes to conversations and sharing experiences.

5.3 Events

Particular events were important in exposing people to new ICTs, or to making decisions about them. However the respondents tended to speak about a range of small events occurring in a situation or relationship, so have been illustrated earlier. However some particular technology encounters stood out. These included moments when they experienced or learned about a technology, when it became particularly salient, they had a particular problem or developed an opinion. Fiona and her children[142] several times remarked about an exhibition when they saw the Internet for the first time.

> Once a British Telecom thing in Edinburgh, so we went into that. What did you think? It though it was a bit slow. I think I as expecting something to be far faster, you don't know exactly what you are really getting yourself, and it really is very fast, if you think about the information and what is available. I think it, it was really for Laura, she was playing around on it, I maybe used it for 2 or 3 minutes, I sort of looked on. [Fiona1 G1 : 364 - 366]

Notably this was not a particularly positive experience, but it appears to have shaped their perception for several years.

Ruth and Maura who work at the further education college both knew about an incident involving the Internet at their college that caused considerable consternation and amusement, among the staff.

> We had a wonderful incident at work recently that caused us to spend a little time looking at the web. We had a guy about my own age with learning and physical disabilities. He was discovered to have opened up all sorts of illegal packages of disgusting pictures. This caused absolute consternation in the college because they thought you couldn't get to such hard core stuff, and it turned out, the tutor concerned was so busy sending emails to her son during class time, thinking all the students were happily employed doing things they were happy to work on their own, that she hadn't noticed. And he'd been printing these pictures off in the class! This is a guy in a wheelchair, the printer is several yards away. He was getting a buzz from the idea that people would see, but when it wasn't noticed, he was able to take these printed images home. There was a bit of trouble about a) how had he got into this. I guess there were questions asked about how it hadn't been noticed. He said obviously, I did it by accident. The college is very clear that if you do that kind of thing you should be automatically expelled. We said this guy needs some kind of therapeutic input, it's a huge life problem. So of course we had to say how did he find these pictures. There's somebody off on long term leave at the moment because he was caught with a lot of stuff. [Ruth 2 G3 : 33 - 33]

Maura also gives an example of the problems she had getting on the Internet, and the affect it had on her continued use:

> I wouldn't know how to get into it. I mean when I first got this machine I started on the Internet and it came up saying there is something illegal so I immediately got out of it but somebody told me that if you pressed the wrong button you can't do something it uses that word. I thought Oh my goodness where am I going and I just stopped. [Maura 2 G3 : 387 - 387

5.4 Christmas: A Key Adoption Event

One particular annual event that involved ICTs that everyone mentioned, and which is therefore important to illustrate in more detail is Christmas. Christmas time is an important annual event in most people lives in this country. Not only is it a time that many people will buy new goods, or upgrade, but it is often a holiday time where people will spend some time learning new things, and spend more time with people they might not see

very often. It is also a period when projects are finished and new projects started. New Year also brings resolutions to learn new things and make changes in life It is time for leisure, for catching up, and for spending time talking, reading, watching TV and playing games. Christmas gift giving adds a twist to the adoption of innovations. Families will have to make decisions together about making purchases such as a home computer, and may give each other consumer electronics – CD player, games, mobile phone etc

In the survey many of the respondents bought ICTs over the Christmas period, and had some time to learn about them. Some also mentioned that is was a time when they watched TV and played video games more than usual.

5.4.1 Christmas gifts

Giving gifts is a complex ritual, symbolic and utilitarian process that considerably confuses the linear, individual adoption process. In general, Christmas gifts (or similar gift giving around other significant cultural events) are exchanges between people with close personal ties, especially family and friends. These gifts are often related to thoughtfully choosing a meaningful token for a significant other, but the Christmas gift can also be the almost ritual annual investment in consumer goods, necessities and luxuries, negotiated between the gift givers, and informed by the offerings and persuasions of the market place, and broader social group.

Christmas gifts came up frequently in the interviews, in discussions about particular products, or more generally when the interviews were conducted around Christmas time (which included most of group 1, group 3 and group 4).

As I expand elsewhere in a more complete history, Aiden (group4) mentions Christmas as being an important event in the adoption of ICTs, for him and his family: his father got a video game, and he got a TV.

> He [Aiden's father] got that [video game console] just before Christmas. Because we used to have a NES, the old Nintendo, years ago it was a NES and em, one of the games for that was Griselda 2 Link and my dad that was his favourite game back then so the

> Nintendo 64 came in, a big thing about Zelda Links "OH I'll have to get it." So he's never off it. He's still playing it, he's been playing it since Christmas time. [Aiden 2 G4 : 682 – 682)

Not only is Christmas a time to buy for other people. Aiden also got a Christmas pay bonus, and treated himself to a new TV(although it turned out he did not actually get the money, and was forced to cancel his holiday).

> Well I got my bonus from my wages, I had about £100 more than I thought I would get and I had some money to spend and that and I thought och I'll just spend loads of money on other people for Christmas and that, bugger it, I'm just going to spend a lot of money on myself (Aiden 2 G4 : 94 - 94).

Helen (Group 1) used Christmas as an excuse to buy herself an electronic bread making machine. Note the influence of her friends in exposing her to the innovation. Unusually, bread making is her hobby and part time job– she bakes for her daughter's retirement home and the local shop. In fact she has spend her whole life baking bread as working in the hotel she owned with her husband.

> I bought a bread making machine, which is quite useful, make your own bread. you put it on in the evening and it is ready next morning
>
> James: How did you find out about that
>
> Oh I have seem them and I have heard people talking about, so I thought it might be quite useful
>
> James: Do your friends
>
> One, er 2 I know have one, and they said they are excellent, so I got one at Christmas this year [Helen Stewart 1 G1 : 229 – 237)

In the family in group 2, Maurice, Ruth, and their sons, Christmas, and Haneka are important times to buy presents for each other, and ICTs have figured high on the shopping list. Daniel, Age 7 likes this time of the year!

> A remote control car. My best month is December, that's the only month I get presents. I get Haneka presents, I get Christmas presents and my birthday presents. I always get a wee thing when it's Joe and Ben's birthday. Last year I chose a wee Lego car which I had in Legoland as well, it was good. I always break things up and make them into my own models (Daniel 2 G3 : 228 – 228)

The first time I interviewed the family, they had given the children a computer for Christmas:

> No, not really. What happened was my dad wanted to get the kids a computer and I weighed up all the options and decided the best thing to do was to sell him my work

> computer, put that downstairs, network it to the machine upstairs and effectively I've still got the use of it or a lot of the time I'm still not using it. But we personally will get the money and we can pay that too. Maurice 1 group 3
>
> .... It's a way to get some money out of the business, I didn't say that. And the business will pay for a new machine Maurice 2 G

In a cross link with his work, it also gave Maurice a chance to upgrade his work machine. The second time was just before Christmas and Maurice was buying them new computer games, which they had really taken to during the year.

> Not much, there haven't been many new ones at all, and between you and me, I bought... I saw some games they wanted and somebody who's a regular supplier has bootlegged it. I'll go into PC World later today for Christmas, spend £100 on games. Maurice 2 g3

On interviewing after Christmas, I discovered that Maurice had also bought his wife Ruth a mobile phone:

> Our daughter has just been given one for her Christmas by her husband who already has one .. [Dorothy 2.2 G3 : 57 – 57)

Ruth's colleague at work, Maura also got offered a mobile phone, but was not sure if she wanted it. In Maura's household, with 2 teenage children, Christmas was also a time to buy a games machine and a computer.

> James They [your children] have a Playstation?
>
> Yes, but my husband is on that half the time anyway!
>
> James: When did you get that?
>
> At Christmas time. My husband said the kids wanted it. (Maura 1 Group 3 : 617 – 624)

> Which is absolutely brilliant. And I've bought a PC for the house and the children were very anti because I had a little Mac that they were very familiar with and I said no it will be much better but they didn't want it for Christmas so I just had to buy it anyway. And em, my daughter in particular was very against it and she spends all the time on it now. And my son has started. [Maura 2 G3 : 13 – 13]

Christmas was also the time they bought a video recorder:

> Do you remember when you got the video recorder?
>
> Yes, my brother gave it to me in Christmas 1984. I used it to tape cartoons for the kids, and hire cartoons. [Maura 1 G3 : 829 – 835]

Finally, Laura (group 1) did not get a Playstation herself, but at least her friend did, so she could go round to play on it with her:

> Well,some of the other comptuer games are better. Playstation's a good, my friend has got one. She got it for Christmas [Laura 1 G1 : 286 – 286]

These examples show that the Christmas gift is a rather complex affair, involving negotiations within and across generations in a family, interchanges between work and home, self gifts, the obligation to give a gift, giving old and new products, buying the latest off the shelf ICTs and investing in ICTs, as well as simply giving someone a celebratory and relationship affirming present. Particular products such as the mobile phone, or a computer are considerable investments for a family, and therefore it is not surprising that there is considerable discussion around purchasing them. They are also products that involve several family members using them.

5.4.2 Non-adoption at Christmas

While some people invest in new techmologies at Christmas, others find think this is really the time *not* to buy. The high rate of technical change and Christmas interact in a peculiar way. Christmas is a time when shops and manufactures sell products planned up to a year in advance, and at high mark ups can put off people from investing at this time. After Christmas new model are introduced for the new year, and it is often possible to get older one's at reduced prices, which add up to an incentive for some people to put off a purchase at this time of year.

> The one we have is probably fairly basic, I am not very conversant when it comes to computers. Laura and Ian, Ian went on a course in Oban, and the girls have done a lot of work and they know what they need to do, what they would like in a computer, but they are a lot of new innovations I gather in the computer world, whatever they are selling, it tends to be what you don't want as there is something better coming. you could go on for ever going on for something better. But I think there is a whole new system coming it, it is a new set up, a new more information on the disk, I can't remember. It was a I think there was a big selling campaign over Christmas (1996), there were a lot of old computers, outmoded ones, holding up some new innovation coming in Feb., March, so I am told this is what they are waiting for. (Fiona interview 1 Group 1 : 342 – 342).

5.4.3 Other Christmas Changes

Christmas shopping is also an activity that may tempt people to shop in a different way to normal. Buying many gifts, spending a lots of money, and buying thing that involve investment and learning may all be better satisfied by alternative shopping mechanisms. For example, Ruth in Group 3

> Do you ever use mail order
>
> I hate that kind of thing, except at Christmas and that's when I use it in a big way.
>
> How do you do that
>
> Yeah, well that's how Christmas gets organised. First of all I take, for the kids stuff, Shona gets a shopping list and goes to the Early Learning Centre using their catalogue or a Boots catalogue, and then besides that I would use charity catalogues. What else have I done. Yes, that's it, because that's the only way to make Christmas manageable because Maurice doesn't take any part in that at all whatsoever. Not his religion but also just because Christmas is my thing, not his. [Ruth 1 G3 : 521 – 527

The use of mail order shopping has a variety of benefits at Christmas – saving time, getting credit for expensive purchases that can be spread over the year, saving the hassle of going to the high street in December etc. The popularity of mail order is growing as many companies move into direct selling. Two ‘broad-sheet’ newspapers ran supplements in November 1999 on the variety of mail order sources of Christmas presents which is one indication of the growing appeal of this way of shopping among a broader group of customers than have traditionally been seen as the natural market for mail order shopping (Observer 11 November 1999).

5.4.4 Christmas use of technology

Christmas time provides a number of opportunities to use ICTs. Many people send Christmas cards or a family letter at this time, a major communication exercise for some people, and one to which ICT can be used to assist or facilitate. Other people, both adults and children, will use their holiday time to use entertainment technology and content heavily – computer games, the television etc. Christmas is also a time when families and friends get together and talk about what they have done over the year, and visit each other’s home, and will certainly see and talk about new ICTs that they have been involved with.

For Ruth and her family, these are all factors for Christmas use of ICTs. However there was a slight twist to use of the video and television. They used their video to record many films that were shown at Christmas, but did not have time to watch them:

> .. Yeah, that I never watch. Yes, we do at Christmas but this Christmas we recorded less because we still hadn't gotten round to looking at the last lot. But yes, that's a way, if we know we're going to miss something we might tape something but again we're just so bad at just sitting down and watching it. [Ruth 1 G3 : 791 – 791]

Maurice also sent his Christmas letter by e-mail too.

> No, just text. The last picture was Maurice's Christmas letter. [Ruth 2 G3 : 33 – 33]

Other traditional Christmas things are also moving into the computer world:

> On my email I've got an advent calendar and it's a lovely advent calendar that came through and I liked it. I tried to put it on disk to take it home but it was too big to fit on a disk so I've just left it now. Leave it till next Christmas. Christmas as time to catch up, relax, be with other people. [Maura 2 G3 : 495 – 495]

However, for some people, struggling to get a computer based calendar to work is not a high priority!

The Christmas holiday was not so much a rest for Maurice and his father John, but a time to catch up missed work. In this case it happened that that involved computers.

> A great granddaughter, wonderful. Number one grandson is doing a postgraduate course on computers at Stirling, but the impression I've got is that he was going on with his course very happily until he discovered that one third of it had never been put in front of him. I don't quite understand how it could happen, but it did. At least my son in law, who used to lecture in computer studies at Stirling, had him over at Christmas time and was coaching him. Apparently he was something like 5 weeks behind which could involve a bit of essay writing. He might just scrape through, because Maurice has been in touch with his buddies at Stirling and they are trying to push the lad. [John 2 G3 : 58 – 58]

Dorethy also gave an example of her family seeing what technology she had, and telling how to use it:

> I have a camera and I took one, I took a few. I like to just snap unposed pictures and at Christmas I get a bit snap happy. At Christmas there was one of Ben and Ruth, and I think your nose was in it! Ruth said "Why don't you use your zoom?" I said "Because I don't have a zoom on this camera!" I think I've had it about 3 years, a nice simple Canon. But zoom seems to be the thing now, which is another bit of technology. I've got a built in flash. [John Dot 2.2 G3 : 397 – 397]

5.4.5 Christmas Events

Some events at Christmas, aside from the purchasing, of goods, watching TV etc, can be trigger points for change. The community events at work and at home can bring people together with new colleagues. Ruth's department started to use more IT, and have a great deal more contact with their computer support colleagues, whom she refers to as 'nerds'. The Christmas lunch was an event to bring them together on a social level:

> Ruth: Och yeah. I mean there's a limit to how many times they'll trail down the corridor but they'll tidy up your files and sort your bugs and things like that
>
> James: Quite friendly
>
> Ruth: Oh aye
>
> James: That's quite lucky, you're quite lucky having them there
>
> Ruth: Yes. Well my colleague was quite wise and he said let's invite them to the Christmas dinner so em, the nerds were duly invited and they're, no they're friendly bunch they're not very nerdish at all really Ruth, Group 3 Interview 2 [Ruth 1 G3 : 899 – 907]

Christmas is also an event in the work calendar, a time to finish off projects, as in the case of Noel (group 3):

> I have put a web site up for the publishing company but not actually publicised it very much. Taken it one step further. That's the project really for the summer, is to make that. We've not really done that because we haven't got that many books to advertise. We've got 4 books in our portfolio. So there is not a great deal to push on that but as a 5th book comes along, hopefully in the summer, and looking at another project to finish about Christmas time. [Noel 1 G2 : 98 - 98

5.5 Summary

The investigation demonstrated the range of situations and relationships that new ICTs were appearing. Work is obviously very important, and probably the main place we are exposed to ICTs, and are obliged to work with them. However through personal relationships we are also finding out about ICTs, and even having them brought into our homes. The media and other household members bring talk about technology into the living-room, and when we meet friends and family it is hard to avoid the topic in

conversation, or steer the enthusiastic person away from their favourite subject. Christmas was identified as a key period in the year when many different factors come together: gift giving, investment in household goods, getting together with family and colleagues, contacting friends and changing routines, all of which are today tied up with the adoption and use of ICTs.

While many people are shown to be actively engaging with technical change, it is also clear that some people actively avoid any sort of information or discussion on certain aspects of new ICTs[143]. There are a number of reasons given, but general it is because the find the subject boring, of no to interest to them, or they think they will not understand it. Dorothy is retired and reads the news paper, but does not take any notice of articles on ICTs[144]. Mary and her friend Ruth are both professional women who have never had a need for many ICTs except the telephone, and who avoid even the television. They have both been able to avoid thinking and engaging with new ICTs, but and are only now finding it difficult to resist, given the demands of others that they should be able to use many computer based applications[145]. In the chapter on Non-use and Non-adoption I will look in more detail at why and how people do not engage with particular innovations, and the relationship to their activities and network, while in the next chapter I look at how the pressure of work or home life eventually pushed many into enquiring about new ICTs and adopting them.

Chapter 6 The Informal Economy: The Network as a source of products and skills

6.1 Introduction

The everyday experience of ICTs, consumer electronics and electronic media, especially computers, far from being an individually consumed commodity, is that of an informal exchange and sharing of artefacts, information and knowledge. In this study many people borrow, lend, share, give and receive as gifts, inherit, marry into, pass on, and sell, hardware and software. They also exchange advice, expertise, and help each other with maintenance, repairs and set-ups. Computers have been an important part of many people's lives for a long time, and many people have had the chance to build up expertise through professional use and personal interest. There are also those, particularly the more technically involved, who may be upgrading their computers and selling on or giving away old machines and software. With other consumer electronics items this is even more common. This is part of the huge market in second hand goods that supports many intermediaries such as charity shops, newspapers and more recently the most successful on-line auction services.

Most models of diffusion and adoption of technologies and innovations assume that it is an individual acts in a social context. The network or significant others – peer groups, reference groups - influences attitudes and adoption of discrete innovations (Katz, 1955, Midgley, 1989). However there are several dynamic processes in innovation and adoption, and there is continual support and exchange in use and adoption of products. Many products do not need to be owned to be used, or for the consumer to be affected by their presence. Sometimes people are able to use products they do not own or have direct access to by borrowing, or proxy use, by getting other to use them for them.

One common feature of all the groups I interviewed was the constant exchange and sharing of goods, ideas, expertise, time, and experiences. All respondents invest time, money and energy in other people, and get a great deal out of those relationships too. It became clear that this was a crucial aspect of the way that we appropriate and use ICTs. Of course there is nothing original about sharing all sorts of products: for example the families shared many everyday things, as did members of the same office. However sharing and exchange cross traditional boundaries, and products and ideas move between situations generally seen as separate. For example, the members of Group 2 working in the same office would share not only issues and items to do with work, but also science-fiction books, a common interest irrelevant to their work. In relation to ICTs, this type of interaction was extremely important in dealing with the uncertainties, difficulties, joys, restrictions and problems that accompany them.

The first part of this section on the Network illustrates the many ways that people trade and exchange goods, services and information. These include:

- Gift giving
- Borrowing
- Using someone else's
- Sharing
- Inheriting
- Passing on
- Proxy use
- Lending Skills
- Giving Knowledge and Opinions

As we shall see when we examine the examples, a group of people emerge who play an important role in the informal economy and appear to be essential to the appropriation and use of ICTs: the *local experts.*

6.1.1 Gift giving

Many of the respondents spoke about gift giving and receiving between family and friends. As detailed in the previous section, computers, mobile phones, video games, software and other products are common gifts at Christmas and for birthdays, and for other significant occasions. The significance of gift giving and receiving is complex: it can be ritualised, part of unwritten rules of a relationship or a group, recognition of a relationship, an attempt to invest in a relationship, to desire to support others or to encourage others to do or think particular things[146] (McCracken, 1988; Belk, 1995). Sometimes gifts can be part of an obligatory exchange (Mauss, 1990/1950), in other cases an altruistic act (Belk, 1995). Cheal (Cheal, 1988) proposes that the domestic gift is an important supplement and alternative to the market, and key part of the maintenance of social relations (Silverstone, 1994, p.46). The industry for certain ICT products, particularly mobile phones and digital TV noticed the importance of offering their products in a way that could be given as a gift, and not tied to a contract or subscription. ICT products can either be bought new for gifts, or the giver can pass on second hand equipment that they may otherwise have sold or thrown away. The giver can even use this gift as an excuse for replacing their own equipment (Maurice, Group2)[147].

In some cases receiving a gift of an ICT product can impose sudden adoption – the receiver may not have considered buying or owning the product before. The awareness and decision making process is therefore sidelined, and the receiver starts with the product in hand. Their reaction to it can be shaped by their relationship with the giver, and often, in the case of ICTs, the giver's attitude to the product, and possible help they can give in the appropriation process, such as setting up, teaching use skills etc. This type of gift can be a sort of vicarious consumption, where the giver is trying to encourage a non-user to engage with a new technology that they think the other should know about, use or understand (McCracken, 1988).

In many cases though, especially with more expensive gifts, giving is a negotiated process. A child may nag her parents for a PlayStation or mobile phone, a husband may offer to give a mobile phone to his wife, a family may discuss the pros and cons of buying a computer for the children. In these cases the recipient may be the expert, and the giver, the provider of cash, or the receiver may be talked into wanted the gift!

In certain case the giver may in fact be buying the product for themselves, and using the other person and the process of gift giving as an excuse for bringing the product into the home. In the case of communication's technologies, the gift may be to enable to the giver to communicate with the recipient such as via e-mail, an answering machine or a mobile phone. It may not actually benefit the recipient as much as the giver! How the recipient actually uses the product is a different matter of course.

6.1.2 Gift of new product

There were many examples of people receiving new products as presents. Aiden (Group 4) was given a PlayStation for his birthday by his parents. They knew he wanted a new games machine, all his friends had the same machine, and his existing machine was showing its age[148]. Amanda (Group 1), who generally avoided ICTs got given a CD player for Christmas one year, and a mobile phone from her mother when she moved to a new home and bought the car. The phone was offered to her and her fiancé, but it came with a catch:

> Oh well my mum bought the phone, she actually bought the phone but I pay the subscriptions on my bill. Amanda Group 1 interview 2

Being offered a new ICT that does not mean that one has to accept and adopt it : Maura was offered a phone as a Christmas present too, but turned it down.

> Actually my husband was asking me if I would like one for Christmas but. And sometimes I mean if I was stuck in traffic and wanted to say I was going to be late home or something like that or my car broke down, it would be useful but I don't know whether it's worth having one just for that. Maura 2 Group 3

Part of the benefit of receiving a gift of a complex product, is that the giver has to put in the time to choosing it. This need not be a chore for the giver, if like Alec (Group 2), it is his hobby to find out about electronic products.

> I bought a video, that was the last one I bought. In fact the television for my dad, the colour television for my dad took a wee bit longer, probably a year I think to do that. Alec 1 Group 2

It can be an advantage to have a family member who takes on a large part of the adoption process!

Another angle on the gift process is given by Valerie (Group 1). She got herself onto a telephone answering service under pressure from her friends:

> Valerie: When Simona told me I had to get one this year which was [laugh] in May, and someone else said they were going to buy me one.
>
> James: oh, right, why do you think they wanted to do that?
>
> Valerie: They were fed up trying to get in touch and not being able to leave a message

The threat of a gift made her realise that she should adopt the service herself. Her friends wanted to impose a technology to her.

Even an unwanted gift can turn out to have uses. Valerie's mother was given a gift she probably would not have bought herself, but she found that is was actually something quite useful.

> But funny enough I got a wee what do you call it holds up walkman that was in a small bowl on side table that my granddaughter gave me a tape, *A Passage to India*, and I listened to that when I was knitting. And I found that quite useful, when you are knitting, and he is watching something you don't watch, can put that on, I quite like that. Helen Group1 interview 1

She later found it much more useful to put on her small grandchild to keep him quiet!

Another example of unwanted gift is given by Trevor (Group 2). Trevor's partner Liz had a Web site given to her as a present from her engineer brother.

> Trevor: Well she's got her own Web sites and she's got, she uses email.
>
> James: Has she made her own Web site?
>
> Trevor: No, her brother actually bought it for her. But she's not the slightest bit interested in it beyond just functional bits of it. She just doesn't, she doesn't dislike it but she doesn't like it. She isn't the slightest bit, it's not a priority for her. [Trevor 1 2]

However after some time, she actually started to see that there might be some use in having it, from the fact of it being their accessible to others in her business working around the world. This is an example of a gift making someone aware of the possibilities, all be it a rather round about way; she did not have to do anything for it to start to become relevant to her business.

Finally, a gift may not be a one off, but a constant cost for either the giver or the receiver. For example, many ICT services require a constant subscription. Bob subscribed to cable television for his children, and was thankful when they left home and he could finally stop paying for it[149].

6.1.3 Gift – passing on ' hand me downs'

The other type of gift mentioned was basically the same, but the giver was passing on a product that they had and wanted to get rid of, send to a good home, or share with a friend now that they did not need it any more[150]. Some times these gifts can be meaningful, given for a reason, other times they are more casual, without significance as a 'gift'. Examples of this passing on include Alex (Group 2), who gave his old computer to his nephew:

> I had a Teletext receiver for the old BBC but I gave the BBC to my nephew and he's quite happy with it and he's looking forward to doing computing in the future. Hoping he won't blame it on me. Alec 1 Group 2
>
> Andy (Group 2) set up his new home, and was given a TV and a video by family and friends:
>
> My mum and dad gave me the television, and Ian and Margaret gave me the video, it's their old machine. [Andy interview 2 Group 1]

He did not have any money at the time, so this was a way they could practically help him with something he actually needed.

Andy gave some computer games to his friend Trevor[151]. He did not need them, and it was just a symbol of friend ship and shared interest. In this case he probably would not have bought them himself. While some people passed on products as gifts in the family and between friends, they were also sold for cash or exchanged for some other product or service too.[152]

6.1.4 Buying from the Network

Buying and selling within a family may have some aspects of gift giving. Outside the family or close friends there is also a mutual benefit that is not present in the formal economy. The seller is known and trusted to the buyer, and can often provide help on using and maintaining the purchase, especially if they have used it themselves. The seller is also able to get the product off their hands more easily than selling it on the open market. There were several examples. Aiden and Ross (Group 4) got a good deal on guitars and an amplifier:

> We got those two guitars and an amplifier from Ross's uncle for £100. So even if neither of us could play, we had to take it, because you're not going to get that good an offer anywhere else. [Aiden 1 Group 4]

Maura bought a computer from the computer support person at her workplace:

> Oh yeah. I mean he does it as a sort of hobby, his interest is computers so parts of it are reconditioned and things like that. I thought it was a good buy. And I thought if I went to a computer shop they'd try and sell me all sorts of things and I don't know what I need, you know, probably a lot of things that I don't need and basically I need it for word processing. Maura, Group 2, interview 2

Andy (Group 2) has a brother in law who wanted to buy a computer. Andy wanted to get rid of his old machine, so they both benefited. The work that Andy put in which would have cost a considerable amount commercially was a hidden benefit to the buyer.

> I mean I know more than him so I'm the closest contact, presumably other than the university lecturers at Heriot-Watt, I think possibly I might be the closest person to hi that knows reasonable amounts. I'm no expert, but I know enough to get over some of the problems that he has but not all obviously. I mean the hardware is still, I'm pretty dodgy about it and I just like follow the handbook and say right, those jumper leads, this lead goes in there, you know. I've got enough confidence to know which are the power leads and which are the data cables and all that sort of thing, but not much more than that. So I built his computer. I gave, when I bought my own one I said that I'd sell him my old one. I ended up having to buy a new mother board and chip for him because the old one was just not working. The bios was screwed or something like that. I don't know how it happened, I don't know which went but in the end he got a really deal and he's got like a 200, is it a 166, no it's a 166 but he's still got the 200 meg hard disk from the original which is a lot more than what he had 'cos it was like a 386 S which isn't even 32 bit, and a 40 meg hard disk. So he's got fast processor and quite a bit of memory, a fairly small hard disk for just a few hundred quid. Andy 1 Group 2

John (Group 3) bought his first computer from his brother in-law too, before passing it onto one of his daughters:

> Eleanor has the computer that my husband had before and that came from Eastbourne [Dorothy's brother]. Dorothy interview 1 Group 3

Here the computer was passed through several hands in the same family, each one benefiting from the previous person upgrading.

6.1.5 Inheriting

While lending, borrowing and buying from one's personal community can be an active process of adoption, some people 'inherit' the possessions of other people through their relationships. Amanda, for example, 'inherited' her fiancé's television set when they moved in together:

> The TV was Alistair's anyway. But that's fine for in here. I mean I suppose it's still got central place in the living room [Amanda Group 1 interview 2]

Mary (Group 3), also inherited a home computer when she married Terry, as did her friend Ruth when she married Maurice, although in their house hold the ownership of the computers is very much attached to Maurice. Only now when the children have a computer does it become one of the family possessions.

6.1.6 Borrowing

One way to get use of a product if we do not have one ourselves is to borrow it. Sometimes we may borrow something to use it for a specific task, such as using someone's computer to write a letter, or borrowing the phone, which I cover in the next section. Longer term, or more general borrowing can be useful to try something out, either just to assess it, out of curiosity, or with the possibility of buying it (Rogers, 1995).

Aiden and Ross (Group 4), who play video games all the time, had a chance to try out a new machine:

> James: Have you tried the Nintendo 64?
>
> Aiden: Yes, Ross had a loan of one for a week. A graphics machine really, there's nothing to it, it's just sharper lines, brighter colours. I wasn't too impressed with it. Aiden interview 1 Group 4

There as another case of borrowing that almost bordered on the gift or passing on, with Amanda's video:

> Amanda: I mean that video recorder is ancient.

> James: Where did you get that?
>
> Amanda: Borrowed it from somebody who's in Singapore for five years. [Amanda Group 1 interview 2]

Not strictly to do with the network, but related to the cross over of work and home, Alec felt he could borrow any multimedia equipment he needed for his own interests from his workplace[153]. In the same office, Neil borrowed a computer from his boss, Noel, to use at home. In some ways the lending of equipment for a long period is a type of gift.

6.1.7 Using someone else's equipment

When other people around us have a particular product, we often have the opportunity to use it, even if we do not take it in into our own possession. This is different from borrowing, or sharing, as it normally involves going to use someone else's equipment in their space, often with them present. For Ross, sharing and using the video games of his friends is just part of their everyday together, of what they share in common:

> Well at the moment we're doing the same most of the time. And we go up to Aiden's and have a laugh, play computer and if it's a great day we'll go up town, have a look about the shops, have a wee eye at the talent. Ross, Group 4 interview 1[154]

This was the same for Laura (Group 1) going to use her cousin's games machine[155]. Having access to use someone else's equipment can be useful for work and study as well as play. Fiona hopes her daughter will get experience of computers while doing a project in her brother in law's business

> So Lisa's going to do her project on Alan's shop and they use computers. We were just talking about that. Fiona 2 Group 1

Going back to Aiden, he found a problem with other people using the cable TV service he subscribed to, so he cancelled it:

> It's because of money. It costs about £6 a month per film channel, and then you add it on to the £13.99 it does add up. For a while I was paying for the film channels off my wages, but then I got sick of that, but mum and dad were watching films all day, so I was paying for it and they were watching it. No. Aiden Group 4 interview 1

His brother obviously had similar feelings:

> Aiden: My little brother's got a wee personal organiser, just got that recently.

> Aiden: Annoying thing is though when he's got all the phone numbers that everybody else needs in it and whenever you go to use it he's got it locked so you can't get into it. Aiden 2 Group4

In Group 3 Dorothy is surrounded by computer users, but generally keeps away from them. However on one occasion she admitted trying out playing a game on her brother's computer during a holiday, an opportunity afforded by, and certainly offered by her brother being a computer enthusiast.

> Oh yes and we've got a book and I could work it out if I so wished but I don't wish. I can work my microwave and I can work my washing machine and the cooker and the Hoover, all the things that are important to me. But the boys have got the computer, my husband's got a computer and my brother has one that does everything but make tea. He's got a very fancy thing and ... and the Internet and all the rest of it and he gets a great deal of pleasure out of it and he's tried to - Oh I had a game of bridge with Omar Sharif once, on his computer cos on holiday you've got the time. I'm just not in that sense interested. I use what I have to use, [Dorothy interview 1 Group 3]

6.1.8 Sharing

Many technologies are shared by a community of users – they are acquired by a group, or shared between them. While some home computers are the domain of one user, for example, in other cases they are bought for a family:

> And I've an old Macintosh which is partly here at Telford and partly at work at home. And I've used it, brought it in once to replace an old machine and I haven't taken it back home yet. So I fully intend to have that Mac at home at some point, so that my daughter can use that and also my wife can use that. One of the reasons we moved house was putting the computer up somewhere. Might even set up a little network around the house. Noel interview 1

Television is another obvious example, where there is often shared ownership and use. The decision to adopt may also be shared, or at least negotiated in a group where everyone has an interest in using it:

> Well, there were a lot of flyers getting passed around the neighbourhood saying they were putting cable in. I think my little brother and myself put a little pressure on mum and dad to get it. I don't think they regret getting it. I don't actually remember the decision to get it, but I remember when it arrived, I was happy. [Aiden 1 4]

As mentioned in the previous section, Aiden, Ross and their friends use each other's computers and video games machine. They also swap games, especially now they have all got the same model of Sony PlayStation[156]. This way they save money, and share in the use and consumption of the same games, even though they are not always playing together in the same room as they did previously, or still do with role-playing games[157].

6.1.9 Proxy use

Getting someone else to do the job for us is the basis of the exchange economy, and the system of division of labour. The use of ICTs is no exception, and is the basis of many commercial ventures, especially for specialised systems needing privileged access or special skills. In this service relationship there is a *proxy use* of technology. The relationship does not always have to be commercial; it is very common in all sorts of other relationships, at home and at work. The increasing accessibility of many ICTs and information services to individuals at home and at work means that it is possible to do many things ourselves that we might previously have handed over to others to do: word processing, buying tickets on line, developing photographs etc. However, he increasing ubiquity of ICT-based services means that there are more opportunities to get someone else to do the job, both through a commercial relationship or a private one. A common feature of proxy use in this research was handing over use of ICTs to others, or having others use ICTs for them.

The proxy use of ICT in a non-commercial relation, or at work actually enables us to avoid adopting a technology, or learning how to use it. Only one person in a community needs to have the technology, for the others to be able to benefit.

> Yeah, I ken someone who's got SKY movies. My boss, quite friendly with him, he stays across the road. If I wanted, yeah, if I wanted anything, if there was anything coming on a movie channel or whatever I could just say could you tape that for me [Aiden Group 4 interview 2].

Proxy use of ICT has another dimension – we hear about and see others adopting and using new technologies and services for their own activities. So even though, for example, I have no interest in use of computers in teaching, if I have a close friend who is a teacher, I may well hear all about it. The media is another source, all be it rather more remote, of proxy use: we read about, and see other people and organisations using new innovations.

The use of and adoption of ICTs by others does not necessarily make it any more likely that we will engage with it. In the case of Dorothy (Group 3), all

the people around her in the family use computers, but she avoids them, and refuses to get involved or interested. A boundary is created between her and those around her due to this difference in interests.

6.2 Using the Skills and Knowledge of Others

I found the exchange of goods a slightly surprising finding from the research, but one that was strikingly pervasive. Based on a broad range of existing evidence of technology development and adoption, the dimension that I had expected to be important was the interchange of knowledge, information, ideas and advice within the network, and that the importance of this in the process of adoption and non adoption of established and new ICTs. This is indeed what I found. The network was an invaluable source of knowledge and skills necessary to make decisions, adoption, cope with problems. It is also a source of knowledge and experience that is used to shape awareness and attitudes.

Some of the ways in which knowledge was developed and past around the network include:

- Giving or being a demonstration of use
- Giving opinion or explanation
- Giving advice on a specific issue
- Sharing ideas and experiences in general conversation
- Teaching
- Doing expert work for free or in exchange for another service (gift of work)

Sometimes it can be one off help, but more often it is on-going, and often covering a range of ‘technical’ subjects. It is here that we see the ‘local expert’, who is the source of demonstration, enthusiasm or expertise for a range of people. The cases also show the process by which people become those ‘local experts’ Only a few examples will be given here, as much of the

exchange of knowledge and ideas is covered in the chapter specifically on local experts.

Within the groups, there were users of technology who demonstrated the use to the others, and were referred to as the ‘computer expert’ or given as examples of where and how technology could be used. Fiona saw how her brother in law was using the technology in his business, Amanda saw her flatmate using the computer at home, and was aware of other friends using computers both as hobbies and for work. Trevor was a demonstration to a whole community of artists that they could new technology in very practical ways, not just for things like word processing, but developing international artistic collaborations. The social network makes the use and relevance of technologies visible in a first hand way. It also reveals the problems and issues involved in adopting and using them.

The network is used to learn practical skills, with one person teaching. Mary is trying to learn some computer skills, and her husband Terry wants to help her learn at home, although they find it hard to find time[158]. The network also provides access to skills. Several people would get others to help them type up documents on the computer. This includes Mary and Terry, Ruth and Maurice and Nigel and Trevor. The person helping has better skills, and more confidence using the computer, so it makes sense to ask them to do the job.

A story told several times in Group 2, as mentioned earlier, was of people with some knowledge of computer hardware helping their friends to build a computer. This was always done as a way to save money, and the labour and knowledge of the friend given for free enabled part of the commercial cost to be cut. This knowledge was passed on from one to the other. Alec helped Andy to build a computer, then Andy built one for his brother in law.

Sometimes we completely rely on others to provide expertise and help to use technology. Maurice’s children rely on him to install programs on the computer, and to fix it when things go wrong[159]

As well as giving practical help, people exchange ideas and experiences with others. When I interviewed Trevor and Andy (Group 2) they had not seen each other for a while, and immediately started talking about computers, what problems they had, what they were using, what things they were thinking of buying, and discussing pros and cons of new products. This way they supported each other with ideas and opinions, just as they did with other common interests, such as art work, which Andy said they would discuss in great depth, and was very important in developing ideas.

Some of these exchanges are between people with common interests and common levels of engagement with the technology, but many of them are based around someone with more expertise and experience helping or advising someone else. This is examined in the section on local experts.

Chapter 7 Living with ICTs: Problems and how we Cope with them

7.1 Introduction

Most people experience problems with machines and new ICTs are no exception. Living and working with and around machines of is not only a story of benefits, but also of problems, uncertainties, demands for change and conflicts. For example, as well as being one of the most useful and flexible devices, the personal computer is also one of the most problematic, with technical problems, continual upgrades, problematic interfaces, and demands on time and money to name a few. The computer is only one of a series of ICT products from the telephone onward that have been accompanied by a whole range of technical and non-technical problems. Many of those interviewed experienced problems adopting, using or owning ICTs. The type of problem is highly dependent on the type of technology: the PC and Internet connections giving considerable technical, learning, service, upgrade and compatability problems. Mobile phones on the other hand, while occasionally having poor infrastructure difficulties, gave problems of usage, service quality (customer care) and personal identity. It is not only technical issues that cause problems, there are many other equally important practical and social problems. Even for technical systems that are largely stable, where the technical problems have mostly disappeared from view, there still remain a host of issues[160]. Nearly all the technologies mentioned involved some conflict between people over usage and meanings, as the domestication literature has shown to be the case with more traditional media and communications technologies. Then there are problems with content, and dislike or disapproval of media products, and in the use of tools: how to get over a particular obstacle in a video game, putting up with disliked TV shows, or design problems in multimedia or graphics. These are nothing to with faults in the technology, but have to be overcome, avoided or put up with just the same.

As well as these practical problems that arise using ICTs, that we have to cope with a range of symbolic issues that provoke negative emotions, (often inspired by the practical problems) such as feelings of being trapped or a slave to the machine. These include negative emotions about loss of freedom, change of identity and socialty. However, just as there are often many positive benefits of using ICTs that make it worthwhile putting up with practical problems, so negative feelings often co-exist with positive emotions in an uneasy ambivalent relationship. This ambivalence and attempts to resolve it is an important feature of living and coping with ICTs (Mick and Fournier, 1998).

This chapter brings out many of the negative issues with ICTs, and of course should not be taken as the whole picture: the many positive aspects are identified elsewhere. Here I attempt to categories the problems as people identified them in the research, informed by existing literature reviewed earlier. The chapter primarily gives examples of the problems, and shows how people coped with those problems, and illustrates the mixed feelings that many have using ICTs. This study of the strategies and processes of technology use and ownership continues the themes introduced in the chapter on non-adoption and non-use.

7.2 Types of problems experienced

The respondents discussed many problems in describing their use of ICTs. Here I organise the problems emerging from the research according to categories that reflect the key source of the problem:

- technical faults,
- knowledge, skills and the user interface,
- learning,
- problems with commercial service,
- social relationships issues,
- everyday usage problems and frustration with limits of the technology
- uncertainty over innovation and upgrading

Some of these problems are one off events, others are chronic, associated with everyday usage of the technology.

The organisation of the data into these categories raises issues of boundaries, and highlights the socio-technical nature of many of the problems. For example, is poor mobile telephone coverage to be classified as a technical problem (and solved by improving the technology), a problem of commercial service (solved by changing service provider), or could be it regarded as a problem of frustration with the limits of the system (the user's expectations running ahead of the technical and commercial development of the system)? Similarly a problem of knowledge about how to use a product can often be seen as a failing of the user interface. Many of the advances that have brought complex ICTs to mass market users have involved refinements in the user interface such as direct manipulation of data, and visualisation techniques in the graphical user interface of a PC, and the alphanumeric LCD display on other products, but these can still cause considerable confusion if they are poorly implemented or with conflicting interfaces on the same machine (Norman, 1990).

Problems are also highly subjective: the keyboard and mouse may not be a problem for many regular PC users, but for novices without typing skills, and for typists with RSI (Repetitive Strain Injury), they are an obstacle to use. The acquisition of typing skills has acquired considerable cultural baggage over the years, associated with secretarial work and low-status jobs, but has very quickly become more associated with computer skills and office jobs using computer communications and information analysis.

Technical problems

These are problems with the artefact, where it breaks down, does not work properly, is difficult to use, is partly broken etc. Network technologies also can have problems with the infrastructure not providing a good service. While this is not a fault in the technology, rather in the service provision, it is appears to the user as a technical limit to use.

Knowledge, skill, and the User interface problems

Many technologies such as the computer place considerable demands on the users' knowledge and skill. Some people see their lack of knowledge as a problem in adoption or use, others will work to over come this by learning. However there is often the option to delegate learning to others, and benefit from their knowledge.

Knowledge and skill problems are often due to difficulties with the user interface. Finding a way for people to interact with complex machines and information systems, including ICTs has always been a problem, and, and generally relies on users making a considerable effort how to control the system, navigate the information, to learn the interface metaphors used, input data etc. Many users find interfaces confusing and difficult to use (Norman, 1990). Designers should not always rely on devices being used on the condition that they left the factory or in the way they were designed for either.

Learning problems:

Although learning would at first sight seem to be a dimension of *knowledge and skills*, the process of learning is also an *activity* that can be problem and sometimes a barrier. Learning takes time and effort and often money. It can entail imposing on others for information and support. Nonetheless, past experience and accumulated knowledge of various sorts including technical knowledge, confidence with using ICTs and knowledge of how to adopt and learn (what could be called technical knowledge capital) can be considerable benefit in learning a new product, while those who never had to use ICTs before or have avoided them can find themselves struggling (Brosnan, 1998).

Commercial Service Organisations and the marketplace:

We have to deal with many organisations and individual on a commercial or intra-organisational basis when we want to use or adopt a technical service. The market for ICTs can be confusing, particularly over choice of supplier and product when we do not have much knowledge of the product, and it can

be difficult to assess the offerings and advice of commercial organisations, be they a local provider like a retail outlet or large bureaucratic organisation such as a network provider. Commercial organisations often do not have the best interests of the customer at heart, and may be reluctant or struggling to provide the level of service that is required. As a result consumers encounter many difficulties with commercial service providers, at the time of purchase, and though the ongoing process of service provision, replacement, upgrading, and repair. In addition to experience of practical problems, this increases uncertainty and lack of confidence in dealing with commercial suppliers and our ability to trust their products and services.

Relationships and the Network:

The adoption and presence of ICTs can cause problems and disputes between friends, in families, among colleagues, and departments of an organisation. Reasons for disputes include disagreements over adoption and purchasing, over responsibility for use, and the appropriate usage of a technology (e.g. how much TV should the children be allowed to watch, and and whether they should be allowed to play video games) (Silverstone, 1989; Moores, 1996). Problems need not be over actual usage of technology, but stem from *talk* about it. Sometimes people can feel excluded from a group when discussions turn to technical issues. In other cases an expert may get fed up being asked for advice or opinions. Ownership of a particular ICT could also cause feelings of envy or resentment, or heighten awareness of lack of resources or lack of skills in relation to that ICT[161].

Everyday Usage and Frustration with Limits:

Usage covers the patterns of everyday use of a product and raises some issues. Some of these are related to the institutional context of use, for example access to a technology can be limited, or in unfavourable conditions, or there may be problems with service. It also applies to the problems of setting up a product to use, and chronic everyday problems which may be technical, interface, service etc. Even when there is nothing

wrong with a technical artefact it can still cause problems when the user is frustrated by not being able to do what they would like to do with it. This limit can be technical, but is often financial as well, if it is possible to upgrade but there is not enough money available to improve it. Network infrastructure can cause problems as well as mentioned before. This is an evolving problem as well: although a technology or service may have been satisfactory when initially adopted we can become aware of its limitations and start to want to do more things with it.

Uncertainty over innovation:

Finally, the rapid pace of innovation can create uncertainties in the decision to adopt or upgrade a technology. This is a problem for first time adopters, and is one reason for non-adoption or delaying adoption, but is just as important, if not more so, for those who already use and own ICTs and are replacing, enhancing or upgrading. Uncertainty occurs over choice of standards, reliability of new products, choice of brand, or the rapidity with which a product versions will become obsolete. Replacing or upgrading to a newer product could overcome current limitations of a technology and resolve existing problems, but could equally bring new problems, especially if it involves adopting cutting edge technology, or new functions and facilities.

This categorisation is explored through the cases shortly and will start to show the tactics and strategies used to cope with or overcome the problems. However there are other types of difficulties or problems that people have with ICTs that are more symbolic and the emotional response to dealing with problems of ICTs.

7.3 Ambivalence over ICTs

In addition to or as a result of. these rather practical problems, there is a range of problematic issues that are raised around the ownership and use of ICTs. These are negative and ambivalent emotions over ICT use and diffusion, often related to the practical problems of living with and using ICTs

(Otnes, Lowrey et al., 1997; Mick and Fournier, 1998). These include issues of personal freedom, such as feelings of enslavement or subjugation to the technology, fear of surveillance, and feelings of being engaged in a constant struggle with technology. Then there are issues of identity and socialisation, such as isolation and exclusion, and personal identity as a user or non-user, including incompetence and being left behind. These feelings can also occur in non-users as documented in an earlier chapter, and relate to more abstract ideas about the encroachment of ICTs on society, of technology out of control, and undermining traditional values.

Problems of freedom:

This is feelings of subjugation to the technology, not being able to do a job without it, a total reliance on technology and the constant struggle with the machine and the bureaucracy that they entrain are common themes. Of course the technology can be seen as merely an extension of the social system in which it is embedded, but the two are mutually dependent. Two examples of this are frustration with being stuck in front of the machine all day, and continually spending time and money trying to stay ahead or on top of technology as it evolves. The benefits of doing these things are known, but they also have considerable costs.

Problems of inclusion and exclusion:

Ignorance of, or lack of access to technology can make people feel they are being excluded from certain activities or changes in society. Many consumer surveys have shown that people worry about being left behind by technological change, In particular, in getting access to work, and feeling that one is in touch and able to understand the world. No longer are computers just the preserve of ‘boffins’, but something that mainstream population is adopting. This creates an ambivalence when someone is actually happy not to be a user or have to deal with the technology, but none the less feels excluded in certain situations. This is not just a problem for non-users, but also those who may be struggling to keep up with current technology. There

are other instances of exclusion, such as owning the wrong standard of technology, that does not enable one to participate in sharing it with others, such as a video game console. Not only is exclusion from a world of ICT users a problem, but exclusion because one *is* an ICT user: one's occupation, interest and ownership of particular ICTs may not be valued at all in a particular social group, where other activities have higher value, leading to ambivalence about being in the group and those particular relationships.

Problems of identity

Discussion of inclusion and exclusion raises the issue of personal identity. Becoming a user may conflict with existing personal identity concepts – especially for someone who has resisted a technology, or who belong to a group stereotyped as non-users. When one sees 'techies' or 'nerds' as being fundamentally different to oneself, adopting a technology can be problematic, needing either a change in perception or a coping strategy to give an acceptable meaning to becoming a user. Psychologists develop the concept of cognitive dissonance[162] to describe this type of ambivalence and ways that it can be resolved. Not only is it how one sees oneself, but how one is perceived and categorised by others – whether it be as an ignorant non-user, or as a boring techie. Of course there are positive images, but these are not the topic of this chapter.

Social or political concerns:

Many have worries about the unrelenting process of technology development and application and the apparent affects on individuals and society. Resistance to technology often has a moral dimension, whether it be nuclear power and weapons, genetic technology or computerisation (Bauer, 1995a). Although the objections can be clear cut, there is often a conflict of interests, and thus an ambivalence: a technology may be a great tool for ones own use, but society, the economy and particular other individuals can be seen as under threat. Over-commercialisation, dehumanising affect of remote

communication, the loss of economic independence etc are all legitimate worries that inspire ambivalence over new technologies.

7.4 Reactions to problems: coping.

Although many of the problems introduced above were commonly experienced across the respondent groups, they way they were interpreted and coped with varied considerably. Many researchers have looked at the way people cope with problems, ambiguities and paradoxes in general, in the consumption of goods (Mick and Fournier, 1998)., and the use of technology, and shown that there are different kinds of reactions and coping strategies. Strategies that involve not using the technology and avoiding it are discussed. In this chapter this is expanded to the whole area of reactions and strategies in relation to these technologies. As has been shown in the chapter on non-adoption in some circumstances there is always the possibility of avoiding the technology or problem all together, by not going near it, or ignoring it[163]. However in many situations this is impossible. Active resistance is often necessary to avoid it (Bauer, 1995a). However, in many situations the use of a technology is not only unavoidable, it is actually sought after, a productive tool, a means of communication or entertainment. The adopters want the service and are willing to put time in to make it work for them, but have to deal with the problems that come with the benefits. Few people found that technologies were straightforward to use, and thus experienced ambiguous emotions over their use. Living with, and coping with these emotions is sometimes as important as actually dealing with the problems of the product. Problems do not arise only from personal use of a technology. People often face difficulties when others adopt or use a product. This can go from conflicts over the time and space dedicated to the technology in an office or home space, to moral objections to the development of an industry and general use of a technology.

The main emotions that people experience when faced by problems such as these are frustration and sometime anger. Panic and fear[164] are also

mentioned, as are feeling of powerlessness and ignorance. The reactions to these emotions and the problems are coped with in a number of ways, including:

- Giving up the technology, or that particular use
- Limiting use in different ways (Miles and Thomas, 1996)
- Handing over use to someone else
- Changing product or service provider
- Finding a 'fix' to get around the problem
- Treat the problems as a challenge to be overcome.
- Learning to cope with the issue as permanent problem
- Taking control from others

Some of the solutions to these problems give definitive, and satisfactory outcomes, but in other cases the concept of coping is clearer: the problem is not resolved, but pushed into the background, always making itself felt every time the coping tactic is put into operation. This creates an ambivalent relationship with the technology.

7.5 Problems and Coping in the Case Studies

7.5.1 Technical Problems

Struggling with the technology is a common theme in many people's experiences of ICTs of all kinds. Technical problems are common, particularly with computers and networks. Those people spending most time working with machines are those most likely to experience problems. This also goes for those who are trying to push the machines to their limits, developing products, finding new uses. It is not surprising that now many ICTs have come to be associated as much with their technical problems as with their benefits.

Andrew (Group 2) is an example of someone who struggles with the problems of a personal computer:

> "I hate Windows 95. It's just like, I hate it. Nothing's gone right from the day, first day I owned it. It's just awful. One of the things is my soundcard's not plug and play and I've still to get it to work properly. I can get the audio working but not the midi, or I can get the midi working but not the audio. At the moment the audio is barely working and suddenly my CD ROM drive has stopped working. The driver has disappeared or something." "[Andy 1 Group 2 : 711 - 711]

It did not get any better over six months later:

> "Well, it's a continuous thing, you always want to upgrade it. I'm happy with it if I could get Windows 95 to settle down. I was sitting here the other week and I started it up and used the CD player, I don't know if it even uses the processor. I switched that off and my mate and I were watching some videos. I didn't switch off the computer so it was in the background, and it crashed, after an hour and a half, nobody was near it. This is the joys of Windows 95. I know a lot of folk who have said that." [ANDY 2 Group 2 : 53 - 53]

He is not the only person to experience problems with computers. They are notorious, and users certainly let those around them know they have problems, as Dorothy knows about her husband's computer problems.

> My husband is always having problems with his and his is a very simple one. [Dorothy 2 Group 3 : 76 - 76]

In these cases the technology breaks for no apparent reason. While breakage in mechanical or electro-mechanical products are often visible, computer software crashing can appear completely mysterious. Training and books do not do much to mitigate the emotions caused by these problems as Andy and John's reactions make clear:

> Yes but none of that coaches [classroom training] you in how to cope with panic attacks and why the computer suddenly hangs up. [John 1 Gr3 : 199 - 199]

Dealing with these problems takes experience and patience, and the support of a friend or someone with more expertise to reassure and lend a hand is very important, as is demonstrated in many of these cases.

However, the reaction of John and Andy to the crashes of their computer are contrasting, Andy, the more experienced user, is frustrated and angry, while John, who is more of a novice, although with a technical background, panics. Neither reaction helps solve the technical problem, but both build up ambivalence about the power of the machine to simultaneously aid and frustrate their work.

Most of the other respondents had problems with some sort of technology not working as expected for various reasons. Amanda found that their mobile network hardly reached their home:

> It's terrible ... I'm just up the road and it's awful reception. So at first it was quite - when we didn't have the phone, didn't get the phone installed for about month. The mobile we thought would be really useful and it wasn't, it was a bit of a disappointment. So now it's just really for the car. [Amanda2 Group 1 : 271 - 272]

This example shows two tactics for dealing with a problem. The solution to the problem, which they discovered after buying the phone, was to *change the use and purpose* they had envisaged for it and *replace it* with a fixed line for home use. Amanda felt dissatisfaction as her expectations have been unfulfilled,.

Maurice too had problems with his mobile service:

> James: Oh you have very good reception here?
>
> Maurice: No it's terrible this part of town is dead, especially in this building, I have to stand by the window.[tries out phone] But I really want to change to something better. I find it absolutely aggravating that I frequently get these calls a day late because the network is overloaded and they say sorry you weren't available. I know very well that not only did I have it turned on but I'm in range the whole time. They just can't cope. And the service, the customer service you get is appalling. Anyway. [Maurice 1 Group 3 : 324 - 328]

Since Maurice needs to use his phone his tactic is one adopted by millions of mobile users: physically move him self. No wonder it is called a mobile phone!

Continual breaking down of computer printers was a problem suffered by Valerie and Amanda in their school:

> The printer, two printers not working for 6 months so everything has to be taken onto a disk. [Valerie 2 Group 1 : 67 - 67]

They do have a short term technical ‘get around’, to copy data onto a disk to transfer it to a working printer again a make do situation that involves them moving around, interrupting someone else using the other machine and so on. Their main problem though, is with repairs, a problem that John (Group3) faced when his printer broke down. John had more than the problem of the printer breaking down, and the service, which is explained later, but also the problem of incompatibility of computer and printer.

These examples were with new products that had problems that were a direct result of bad design or poor service. However many of us also use old products that are probably past their design life. Fiona's family (Group 1) for example have an old video player:

> Yes, one that I can't necessarily... it is an old one, it doesn't work properly Laura does all. Something is broken, you have to click one thing and mess around with something else. [Fiona1 Group 1 : 321 - 321]

There is a solution to this problem, which involves applying a bit of extra skill to make up for the broken part. In this case the skill of getting it to work is held by Fiona's daughter, who is always around to deal with it. solution: hand over to someone who knows how to fix it.

Computer networks and the Internet were also a source of problems, even when the computers themselves have been running well:

> And any problems that's been have been networking and server problems which are down to the IT section. There's a constant flow of servers going down and email crashing, but I believe that's endemic everywhere. [Neil2 Group 2 : 167 - 167]

The Internet was a very new consumer product at the time of the research, and introduced a whole raft of problems, technical, knowledge, service and learning. Those in the study who were using the Internet found considerable problems associated with its use, although many of these are not 'technical' problems, but more limitations on the speed of the service, and of finding anything on the Web. Security is a problem raised by Terry (Group 3)

> I use the Internet, I wouldn't say a lot. My experience of when I have used it is it's not as great as I would say it's made out to be. The only occasion I've used it is through work and one thing that is common to the all information on the Internet is it's not policed so you don't know about it's accuracy. We use email quite constantly and even there there's a problem about security. Some of the information that we're sending across the highways as it were need to be encrypted and password protected, that type of thing because it is sensitive. Also the only two serious viruses that we've ever had on our network have been inadvertently brought in through emails that were not properly dealt with and so you know there is quite a bit of danger there. When it comes to personal use, I'd be very wary as an individual bringing in information onto my say PC system that can easily be infected by virus so I'm not happy about using the Internet currently. [Mary+Terry 1 Group 3 : 1256 - 1256]

Terry's solution to worries about Internet security is to use protection software at work, but at home he has decided to avoid connection to the Internet until he is more certain.

These technical problems of faulty products, and poor network service are generally the fault of the designers or service company, but not entirely: users misuse and break things, and struggle to keep them going.

7.5.2 Knowledge, Skills and the User interface

A big problem with many ICTs is not knowing how to use a product or service. Many products require that the user develop certain minimum skills and knowledge to use them. Many also have advanced functions that require specialised knowledge. Beyond this there is advanced technical knowledge for technical innovation and development and knowledge about servicing, application to activities etc that is more in the professional domain.[165] Knowing that one does not know, and may never be able to learn (dealt with in the next section) is a problem that can put many people off using a technology at all, or severely restricts their use. Few people will have the motivation, experience and time to learn how to use every function, and with constant innovation there are always new things to learn. One aspect of use that causes problems is knowing how to use the user interface. Many people struggle to overcome its difficulties – how to type fast, or knowing which button to press is a constant source of problems.

Maurice and his father-in-law had problems with their computers as they tried add components. Both bought products that did not work with their computer, John and printer and Maurice a communications port:

> The last big item I bought for work was a new em, the SCSI card because the new machine I bought at Christmas only has two ISA slots and the card I had which was perfectly happily servicing my scanner wasn't an ISA card, ISA slots are all full on my machine. Nobody told me that was going to happen. That's another £100 down the drain I'm afraid [Maurice 1 group 3]

The problem can be seen from three angles: as a technical problem of incompatibility and technical specification that can be overcome by changing the product; as a knowledge problem, as Maurice and John did not check, or know to check that there would be problems fitting the new peripherals; and finally a service problem, the people who sold the product did not make sure that their client understood what they were buying. In fact no-one is to blame,

but we can see this as a result of the rapid innovation of a group of products that are developed and sold in a market where there is no clear control over the technology, where we benefit from the openness and rapid change in technology, but at the same time must control our own risks, often with little guidance.

Others had problems connected to the use of their machines, and not knowing what to do when something unusual appeared to happen, as in the case of Amanda.

> Yeah, occasionally. If anything goes wrong or you're looking for - sometimes things, especially the kids having quite a lot of free access and things, documents get lost and put in other folders and you know, so occasionally I've had to ask how, I mean I know there's a finder thing but I can't often, I mean you often find it in something marked documents and it's supposed to be in something else. There's one person at school who's quite clued up on the computers. [Amanda 1 group 1]

Having only limited knowledge, and many other things to do apart from struggling with a machine, Amanda gets flustered. There is a solution, call the school expert who can come and sort the machine and her out. Her problem is not a technical fault that she does not know how to fix, but caused by the principal users, the 5-9 year old students. It could be also construed as user interface problem though, a system that allowed things to 'get lost'.

Amanda also felt her lack of knowledge would cause problems with the machine, which is one reason she did not feel comfortable playing around on her flatmates computer which he used for his studies, despite his invitation for her to use it (Amanda, group 1, Interview 1).

7.5.3 The User Interface

The user interface has been a perennial problem for many electronic technologies. The keyboard or control keys and the visual feedback systems are compromises of technology, cost, the design of looks to sell the machine, skills of individual users, and skills present across the market of users. The domestic video recorder has been replaced by the computer interface as the problem interface for many people, as a multitude of machine designers attempt to make many applications and functions of the machine available via a simple keyboard and screen. This does not mean the video problem

does not still exist for many owners and users, indeed there are many people who struggle with many home electronics products from microwaves though TV remotes and music systems to the motor car. These problems are hardly helped when the interface is partly broken, as was the case with Fiona (Group 1 above). At work most interfaces are often designed more effectively than for home users, where looks are an important factor, and training is an integral part of the appropriation of new technological devices from machine tools to cash registers. The bare PC interface, with its wonderful flexibility and room for personalisation is also the cause of many problems, quickly identified by John (Group 3)

> Well, I said it before to various folk, none of whom are in the computer industry. To me an infinite stupidity is the inability for the programmer to put on every screen the same word meaning clear the screen. Clear, quit, exit, and I think there are two others, coupled with, zap that little cross in the top right hand corner. So off the cuff there are five different ways, but again, I am not very good at learning the basics. You know the phrase, "If nothing else works read the instructions". I jab away at buttons and nothing happens. Why don't they just say "escape" all the time? I used to write handbooks on how to carry out certain tests and they had to be idiot proof and if there's an emergency procedure it's on the first page, if in doubt press the right button which is marked, Escape, or Fire, or Emergency. But it's on the first page, not buried in an annexe. To me that is a major shortcoming of electronic devices. [John 2 Group 3 : 82 - 82]

In the second interview explained his problems with the video recorder:

> No, somewhere out there we feel it could all be made possible. We have all the technology, all we have to do is bolt it together. Then you say "I'd like to record this television programme, how the hell does the VCR work?" I had an old machine once where you could readily interrogate it to see if there were any empty slots to put your recording demands. But with this one it's so minuscule which programme or channel you're on. At the worst possible moment, I find the thing is full of junk, and I have to get the handbook out. I want a button that says, I've seen it on some deletion screens on the computer "delete all". I want a button on my VCR where if it's full I can wipe the whole lot out. Again we come back to electronic devices, wonderful things. I've two hand controllers and don't understand a third of the buttons on either of them. [John 2 Group 3 : 70 - 70]

John is frustrated by the user interfaces he is provided with, and knows exactly what he wants:

> Yes, but I don't know how to work it [teletext]. I want a button that says teletext. [John Dot 2.2 Group 3 : 108 - 108]

Not only is the product a problem for him, but also me thinks that is should could be an easy issue for the designers to sort out – he is frustrated by the industry and he powerlessness in influence good design.

One innovation that is generally seen as a big convenience, the remote control actually proved problematic to Maura (Group 3).

> The music system, I don't know how to switch it on. It's got a remote. I was all right until remotes were invented.

However, like Mike and Ruth, she relies on others to turn it on, and to set the video recorder.

The keyboard on computer is a problem for those wanting to use the machine, even for the simplest task, such as typing a document. Both Ruth and Mary (Group 3) get their husbands to do the typing, since they are more proficient typists due to their everyday work with computers.

> I spend all day writing it and scribbling. You know I work so hard that it's probably 11 o'clock at night and it's to be sent off the next morning and so Terry types it because he's quicker cos I always leave them till the last minute, don't I. [Mary and Terry 2 Group 3 : 172 - 172]

Their solution to their own lack of skills is to 'borrow' them from someone else. It is also a bit ironic that the husbands are doing the typing for their wives, surely a sign of the times, and of old stereotypes being overturned by social and technical change.

7.5.4 Learning

The learning process around the appropriation of ICT can be quite an onerous activity. Leaving aside the knowledge needed before buying a product, if it is acquired this way, there are many things to learn, in a process that rarely ended. New knowledge is acquired in setting up, learning the basic functions, finding out the benefits and limits of use, 'hidden' problems not anticipated before hand, discovering the attitudes of others and dealing with changing relationships, and the expectations of others…

Andy uses computers for his design work, and would like to know how to use the applications in more sophisticated ways through programming:

> Director, trying to learn lingo. I've been trying to learn Java script but I've sort of had to put that on the back burner. I think dynamic html, html before `Java script I'll really have to get to grips with within the next year or so. I'm trying, because I'm using Director in this project, there's really quite difficult bits of lingo that has to be put in so I have to learn things and after that I want to learn to use 3D modelling programmes. They're not very

> intuitive so you have to really sit down and learn them and I've got 3D Studio Maxer, a pirated copy, copy of 3D studio from Ingliston so I'll load that up once I've got these projects out the road and just sit down and learn. [Andy 1 Group 2 : 495 - 495]

The time he knows he would have to put in is a problem with his other commitments, and over a year later he had still not found time to do it. Time is not the only problem, he has no background in computer programming and despite playing around, it does not come easily to him:

> Yes, the possibilities, just with the technology, the hardware and the software developing, you see more possibilities with every new bit of software. There are things I'd really like to get into, but problems with time and some huge steep learning curves, I've been saying for years that I'll have to start learning a 3D modelling and rendering package, but they're very difficult to learn, and I've not found one that's very intuitive. The ones I have tinkered with, there are huge learning. [ANDY 2 Group 2 : 41 - 41]

He has not been able to adopt a product he would like to use, because he does not have the time or the background to get on top of it.

Mary and Terry (Group 3) also find it hard to find the time to sit down and learn how to use the computer, especially as Terry is helping Mary:

> Terry: It's finding time when both of us are free from other things.
>
> Mary: We have some time but it's the motivation as well.
>
> Terry: Well it's not that. We can only do it at times when Charlotte [the baby] is really in bed because if she's awake and around she demands the attention of at least one of us and you can't teach somebody what to do with some sort of software whilst you've got a small child in the same room demanding your attention. So it's a question of finding the time available to sort of show Mary about the software that we have available on our own home PC. That's not easy.

Although Mary has a ‘local expert’, her husband, available to help her, it is hard co-ordinate time, and since he is also her husband, it is hard to focus on the learning task when there are other things to do. In a more formal relationship, it might be easier to commit to specific times.

However, learning in more formal environment can also cause problems, as John (Group 3) found out. He took up using the PC in his retirement in order to study. He went on several formal college courses to learn how to use it, sitting in the back of a class of teenagers. This taught him many things, but does not answer all the problems, especially when he is confronted with a new interface. He admits it is partly his fault for not systematically learning how to use it:

> I am not very good at learning the basics. You know the phrase, "If nothing else works read the instructions". I jab away at buttons and nothing happens.[John 1, Group 3]

John uses this strategy - have a go and try and get by on intuition, but finds that it does not really work very well for the personal computer.

Maurice (Group3) has a similar problem, he cannot seem to get round to systematically learning how to use his mobile phone:

> Oh yeah. I mean first of all I think it's a bit, that thing's quite bulky. Secondly, I'm almost certainly, if I see that I can get a cheaper service somewhere else. I mean there's absolutely nothing to keep me with them. It's really this customer service thing. I hate poor service but I'm as lazy as everybody else about doing anything about it. But I mean while I'm getting poor service and it's very expensive then yeah I will get round to it. But part of the problem is I can't get on terms with that machine. I mean I can't get to like it. I've never really taken the trouble to sit down and study it but you know it's got this menu system. I can't seem to get it to do what I want. It's become one of these peripheral things which bothers me, bothers me enough to complain about it but not enough to say right I'm going to get on top of this. You know, I'm not friendly with it and I feel like getting friendly with it is going to cost me money in trial calls and this sort of thing. Do you know what I'm saying? I'm being stupid about it is what I'm saying and I haven't got, I'm not in the right relationship with it to get to grips. [Maurice 1 Group 3 : 340 - 340]

He raises an interesting concept of ‘being friendly’ with the machine. He does not feel comfortable with it, even though he has owned and used it for several years. Is this a domestication or appropriation process gone wrong? Until he develops the right attitude to the device he will never get to grips with it or use it correctly. However this seems like a chicken and egg situation, and highlights the continuing ambivalence of a relationship with a technology, even for a relative expert. This ambivalence is similar to Andy (Group 2) and his PC, although the main problem is faults with the operating system in the example under technical problems.

7.5.5 Commercial service

Many ICTs need continual outside servicing: a network service for a communications technology, repairs and upgrades from a supplier or service department, or provision of new media content and applications. The relationship with those suppliers was a common problem. This is a problem that often compounds technical problems: not only does it break down, but it is difficult to get it repaired.

Lack of provision of mobile service was a problem mentioned earlier by Fiona, Maurice and also by Trevor and his wife (Group 2) as a technical problem, and was not particularly nefarious. However the phone company presented a bigger problems for Bob (Group 4):

> Yes, it's much better that BT. I had a big row with them, there was a £360 phone bill and it turned out a call was made on my system on 26 December and it was Boxing Day, 12 hours continuous to a Premium Rate line. I know I didn't make the call and Ross and Leanne were with their mother. Someone somewhere got access to my line and made that call. It turned out to be a competition line. I think it was someone at BT who was trying to generate money. I was confident they would quash it. It ended up that I had to go to OFTEL and even they weren't any use. So I refused to pay the bill, let them cut me off and went over to Telewest. Somewhere I'll have a black mark, because it looks like a debt. [BOB 2 Group 4 : 78 - 78]

New developments in technologies and services on the telephone network may create a range of business opportunities and services for customers, but in this case it appears to have backfired for Bob. His technical competence counted for nothing faced with a multinational corporation refusing to consider his case. Nonetheless Bob found a solution, although one that may possibly come back at him in the future – change supplier to another company.

Maurice (Group 3) is an intensive user of ICTs for his work, and is highly critical of most of the service he has received from telephone companies:

> [Maurice 1 Group 3 : 784 - 784]Well, I get a red haze in front of my eyes when I get unavailability from other telephone providers. It seems to me that's what they should be about. "Sorry, all lines are busy" is what they say but it's relatively infrequent. I mean it's much more frequent than you've got with BT but it still happens.

This pales next to the problems he has with Internet connections and mobile phones:

> [Maurice 2 Group 3 : 80 - 80] Here's a story. I recommended her [a friend] to a supplier on the Internet and I was emphatic about what I did because I had previously signed up with Cable Internet, because Telewest was here when I did the proposal and I thought I'd get theirs, not realising one ISP is very different from another. So the two things that are different about Cable Internet as an ISP are first of all, the servers are often very slow, and secondly their support is, well let's call it thin. The problem you'll get that I got repeatedly with mail servers, is if you leave your mail on the server and you delete it, and if you interrupt a mail down-load, the server loses track of where you were. So then it says you've got 1000 messages. You ring up the support services and ask them to delete, this happened to me just before my summer holidays. I was on the phone for 3-4 times a day for 2 weeks, and at the end of it they didn't fix it and I permanently lost 1 week's mail. They said they gave me a week's mail with the wrong dates on from a month back. At one point I was actually telling the guy on the phone how to use the Unix tools for this garbage. ...

Maurice's ignorance or naivety about the quality of Internet Service providers got him in trouble, a problem he tried to solve by applying his expertise, but to no avail. Eventually he learned a lesson that it pays to pay for service, and changed supplier, and was much more satisfied with the level of support.

> I looked at the one that was most boring and businessy, it's as simple as that. The differences between £9 and £12 a month, when you weigh that against the sort of anxiety and horror this incident represents, it's just actually ridiculous to save £3 a month. I work with Pipex because they are boring and businessy, and the same thing happened, their service was much faster. They fixed it no trouble. And in addition they've got this interface to the server so even at worst you could see your recent messages. I actually talked after this to someone on one of my courses who was middle manager in Pipex and I told him that experience. He said I'm not surprised to hear this, the ISPs are overwhelmed by the amount of criticism they're getting, they simply can't cope. They haven't enough people with the technical expertise to handle these things, we're not talking about highly trained people, we're talking about people using VI. This guy couldn't use VI. There's not that many people around that can use VI [an operating system environment] that are prepared to work for the wages. It was very interesting. [Maurice 2 Group 3 : 84 - 84]

Being very competent with computers, a rare skill, he was very happy to see he could get the messages on their machine, a service that would have been irrelevant to many others. Maurice's experience also highlights some of the problems of commercial companies trying to develop Internet services very fast to keep up with demand and changing technology. Lack of staff, of stretching resources etc ultimately affects the consumer of their services.

Finally, Maurice's dealing with mobile phone companies is in a very similar vein, :

> Well all too simple really. I went to Carphone Warehouse. I mean I'm not up on the technology. That's another - the number of complaints I have is amazing. I found Carphone Warehouse not too bad to deal with but they misled me, perhaps unintentionally in some way or other and then when I complained about it, it wasn't a big issue at that point and they said "Oh well we don't really think we're responsible." which I could have taken but we'll give you £20 voucher as a goodwill gesture so fine, that'll make me feel better. So then the £20 voucher doesn't come and that makes me feel much worse towards them. So then finally I think they sent me something or I have something which is back here, a customer care questionnaire, you know how have we been for you. So I wrote to them about this, I wrote them a long story about this and it was kind of quite mildly phrased about you know I didn't think this was very good and if you're going to you're either one thing or the other, if you are going to offer customer service - Carphone Warehouse make a deal of the customer service - you might as well make sure you're doing it properly. Offering people things and then not doing it is actually much worse than almost anything else you can do. At the bottom it said well are you going to go to Carphone Warehouse again? And I wrote it depends on what response I get from this questionnaire to what I'm writing here. What response did I get, absolutely none at all. They make a big deal about this, that Charles thing, the man who founded Carphone

> Warehouse reads every one of these. I just don't, how they can't notice what a bad impression is going to be made. There's no way I'd feel like going back to them. So yeah, it wasn't very much trouble to get it but it was the wrong thing. I mean basically Cellnet - I don't know what would be the right network. But at that time which was a year ago One to One and Orange which are the two I look at more seriously just didn't have that much coverage in Scotland. But I think these services are fantastically overpriced and what you get from the networks, I don't know about others but Cellnet is very poor. I'm not positive about the experience at all. That's why, Carphone Warehouse gave me an instruction booklet which had all the sub numbers wrong, totally out of date, so I rang Cellnet, I mean I was actually paying money for operating costs of Cellnet and I didn't know about this until they told me. "Oh that's terrible, Carphone Warehouse is really bad, keep on telling them they're giving out these out of date instructions." And I said "Will you send me the up to date ones?" and they said yes, and then nothing happened for quite a long time - this is Cellnet - and I said what about this that you were supposed to be sending this, and I got somebody saying "Well you know we can't just print them off for you." It was really bizarre. Said "We're out of stock, it takes time to bin these things." And I said "Well but you know all the time I'm paying for your service as though you were giving me a service and you're telling me it's inconvenient to you to give me the service that I'm paying for." A year later I've still never received anything ... received this. I just think the only reason these people are still in business is because of people like me just too lazy to do anything about it. [Maurice 1 Group 3 : 336 - 336]

...No wonder his father in law thinks he is harassed!

John himself had problems, but with a smaller company supplying:

> [John 1 Gr3 : 175 - 175]Start from scratch. I know nothing about computers, I know which keys to press to produce certain facts. My printer broke down and I was told the cost of repair was so astronomically close to the cost of a new printer, forget it. So I went into this mob, Datastream in Leith who were a very high flying outfit I was recommended to. I said, I have this computer, I want a printer. He said, "we've got this one for £150". So I said, "Great, marvellous". I bought it, took it home, sat down, looked at the books. It required 16 megabytes to drive the beast and my computer was 8 megabytes. I rang the shop and they ask me to bring the computer in and they would upgrade it. Fine. I specified the computer I had, an Amstrad. Now I had to keep phoning them, they never phoned me. Then I got the news that it couldn't upgrade this computer, but there was an office that was upgrading and they would get me one of the second hand computers being discarded. This went on for two and three weeks. They never seemed to have a second hand computer. So I opened the Scotsman one day and there was this little advert, second hand computer. They were going to get me, what's the base of the computer... I was to get one of these absolutely blank from a shop in Dalry Road. I went in and sure enough they had 8 megabyte versions. The 16 megabytes ones might be in next week, they said. Maurice said "I wouldn't touch them". Thought he could have done it, it was going to be a time-consuming job for him. So I went down there. I asked, "Will this machine drive that printer" Yes. So I brought it home, installed the printer. A nice little word processing system called "Fine Words". Apart from the screen going blank on 3 occasions in the past 2 months, it's been okay, so I'm now going to try to sort out a back-up system.

Again, his lack of knowledge about what was important meant he could not deal with the supplier on a level footing. Luckily he had some support from Maurice, and eventually got over the problem, but it did nothing to improve his, or his wife's impression of computers or the industry.

The policies of network providers and their inflexibility of service also caused problems for Aiden.

> Well I'd like to, I'd like to phone up cable and just tell them the exact channels I wanted because there's so many channels I just never ever watch and if I could, if they could just work out a system where you paid for a set amount for each channel then I could just pick the ones I wanted, Discovery channel, SKY1, whatever. [Aiden 2 Group 4 : 582 - 582]

It is not always commercial services that are troublesome, even with in an organisation the support service can be very poor. Valerie (Group 1) complained about the lack of computer support from the centralised regional computing service of the education department.

> There is a central support office for all of Lothian, but it can take months for them to deal with a problem. [Valerie 1 Group 1 : 83 - 83]

This centralised system continued to provide them with very poor service at the second interview:

> And we still have great difficulties in having things repaired. The printer, two printers not working for 6 months so everything has to be taken onto a disk.... [Valerie 2 Group 1 : 67 - 67]

> Well we've nowhere to send them to be repaired. The place that we did have has been shut down and there's some - some - we're not allowed to send them to certain places. It's quite difficult. I don't know the ins and the outs of the it. Yes, it takes a long time to get anyone to come and repair. [Valerie 2 Group 1 : 71 - 71]

The local authority had announced massive spending on putting all school on-line to the Internet, but for a small primary school they could not even provide basic service.

Adopting and using new ICT services involves a steep learning curve, considerable investment of time and money, and developing an increasing reliance on the technology. Large, faceless organisations appear to be very poor at dealing with problems, and even small ones are unlikely to provide good service when problems arise. In some cases it is possible to take the business elsewhere, or use another supplier, but this is not always the case, and if they have already taken money, or are responsible for data, then the customer is the looser. Over time, existing customers ‘get wise’ and can pass this expertise on to others, but if all the suppliers are equally bad then there is no choice, and ICTs service companies get added to the long list of unhelpful bureaucracies that we have to be put up with in our everyday life.

7.5.6 Relationships

We consume ICTs in a community, and ICTs enter into the relationships of the community in many ways, as has been shown in other research, and already demonstrated in this study. Like the other studies (e.g. (Lull, 1995; Moores, 1996)), the respondents brought up a number of problems that new ICTs created or highlighted in their personal relationships. These problems include disputes over the cost of buying or subscribing to services, and over time and space allocated to use of the ICT, and whether on not a particular ICT is appropriate at all. Continual discussion of ICT also brought up feelings of exclusion from conversation for those not 'in the know'.

ICT cost money and this causes problems. Aiden (Group 4) mentioned two problems that occurred with his parents over spending on shared services, the phone and cable TV. The first was over calls to mobile phones:

> I dinnae really use the phone much at all. Och, yeah I do call mobile phones because I got pulled up by my mum when the bill comes in. It's usually only something like a couple of pound but that just happens to be the only 2 phone calls I've made you know and it's been a pager or something. [Aiden 2 Group 4 : 402 - 402]

In the second instance he was footing the bill for film channels on cable TV:

> For a while I was paying for the film channels off my wages, but then I got sick of that, but mum and dad were watching films all day, so I was paying for it and they were watching it. No.[Aiden group4, interview 1]

Aiden solved the problem by cancelling the subscription, a unilateral decision. John and his wife Dorothy (Group 3) have a limited budget too, and this means that John cannot spend some of the money he would like to on an Internet connection, especially as the cost is uncertain:

> James: Do you know quite a lot of people now who have email?
>
> My son-in-law's got it, my brother in law's got it. My granddaughter in Hong Kong has access to email. She wouldn't have a computer at all, that's too expensive for her, but she has access to email. And various other relatives and friends have email, so I'd be only too happy to use it. But I've yet to persuade my lady wife that we can afford it! If it was simply the cost of the Modem and minute telephone costs, then well and good. No-one has yet assured me in simple short words the cost thereof. [John 2 Group 3 : 12 - 14].

Mary and Terry (Group 1) also disagree over spending on computer equipment, again it is the husband who wants the gadget and his wife who resists:

> Mary: He would like to spend a lot more. He would like to update it to buy a new one and I won't let him because it's so expensive and I don't think he can justify it for what he uses it for at home.
>
> James: What is that?
>
> Mary: You know he does things about what flowers we've got in the garden and when they're going to come into season so that we always have something flowering in every month so he'll - but you can do that in your head or on a piece of paper, you don't need to spend thousands to get a better computer to do those kind of things. Or our budget, our finances.
>
> James: Does he have a CD ROM player?
>
> Mary: No, he doesn't but he would have if it wasn't for me…Tell me, why should he spend all that money when I don't. [Mary+Terry 1 Group 3 : 1180 - 1198]

In both these cases the decision not to spend the money is arrived at by one person, but under pressure from the others not to spend. However the decision could have gone in favour of adoption despite objections and money constraints, as Moores (Moores, 1996) shows in his examples with satellite television. In these examples I was only present for a limited period and never discovered whether these couples eventually decided to adopt.

Problems over money can arise after it has been spent. Aiden was very excited to buy a new TV set for Christmas, expecting to get a Christmas bonus. He also started to pay instalments for a holiday with his girlfriend. When his bonus failed to materialise, he was forced to cancel his holiday, which hardly pleased his girlfriend. Although he enjoyed using the TV set, he also felt regrets about buying it, knowing that he might better have spent the money on his holiday, and satisfied his girlfriend.

Disputes over television viewing are a very established part of the place of TV within the family (Morley, 1986; Lull, 1990). It was an issue in Ruth's family (Group 3) and Fiona's family (Group 1). In particular, Ruth and Maurice had disagreements over how much TV their children should watch, and what they should watch.

> Well we've been very conservative about what they view and they don't actually watch television, they just see videos. Sounds awful but it's all, it's very controlled in that respect. And that's chiefly because we remain in a state of tension where Maurice would get rid of the TV all together and I won't have it because it's my best childminder and em, I think therefore we tend to have what we would consider sort of good quality story videos, rather than the junky cartoons that are zappy and fast in America. Having said that of course the greatest thing is to collect all those Disney classics as they come along and the kids have a fair number of them... [Ruth 1 Group 3 : 603 - 603]

> Maurice is just very agin the sort of rubbish coming in to the kids. It's ironic. He sees television as being the sort of access point for a lot of junk the kids would be stuck in front of. Somehow these games on the computer don't fall into that category and maybe it's just the level of control you can have over that. [Ruth 1 Group 3 : 847 - 847]

Maurice and Ruth have come to an arrangement over their children's use of the TV that balances his dislike of it, and her use of it as a child minding device by using the video player as a way of controlling content. Of course for the children, their parents' attitude is a problem they are not able to get round, but it is not a particularly urgent problem either, given the other activities they are encouraged and allowed to do.

The last comment on video games is intriguing, given that video games and computers have come in for similar negative press[166](Funk and Buchman, 1995) over their affect on children as has the television (Hodge and Tripp, 1986; Berry and Asamen, 1993). There are two issues here related to the technology as a media: one is the appropriateness of the video game as technology and media form, and another of the particular games or content. Maurice is happier using the computer as a child minder and educator, but Ruth is not so convinced[167], although this could be linked to Ruth's lack of knowledge about the computer, and inability to set it up. Their children aged 5 and 7 use the computer together, but also fight over it, over whose turn it is, what game to play, and who is the better player. The computer and the games raise an interesting issue in their relationship, since the younger one is more adept with the computer than his older brother, who is usually more dominant and articulate in their relationship.

In Group 1, Fiona refused to buy her teenage daughter Laura a video game console as she takes a dim view of the television screen as way of spending any time at all. This was not a one-off request on Laura's part, but a long running, if not very problematic stand-off. The solution was for Laura to

continue going to play with her friend, something that satisfied her, and her mother who did not like the idea of her spending hours playing alone.

Among adults, playing video games can cause problems too. Andy, Maurice and Trevor, three men who spend considerable time with their computers, all said that they found games too addictive and made themselves take the software off the computer. For Trevor though there was an extra dimension of conflict with his wife/partner over time spent playing:

> Yeah. I enjoyed them too much, I enjoyed, not so much the blasting sort of games but some of the flight simulation stuff, I mean you can get the professional quality ones like you can literally learn how to fly a plane. Hours and hours and hours disappear down the drain of this thing so I took it off and em, I've still got them in my room but I won't put it back on again because it was just, I was, it caused too much domestic friction. [Trevor 1 GR 2 : 216 - 216]

Trevor ran into another problem with his friend and business partner Nigel over use of the computer for work. They need to use the computer for work. Trevor is very pragmatic about it and just gets on with it, but Nigel has a strong aversion into which he integrates his radical political views. However this distrust is also based on lack of confidence and skill. The problem here was Nigel was continually relying on Trevor to do things for him, which Trevor saw as irrationally putting the burden onto him to do the work, taking advantage of their relationship. Nigel had to give in eventually after Trevor laid down an ultimatum to learn to use a computer. This was not the first time that Nigel had come into conflict with someone over a computer. His friends Andy and Trevor both mentioned his relationship with a previous girlfriend where purchase of a computer increased disagreement:

> Well, Nigel's not that into computers. He's not a technophobe but he was thinking about it, he used to live with a girl in Leith, when he worked in Leith, that's one reason he went up to Inverness 'cos he split up, but she was computer literate and they were, she was wanting to get a computer. He wasn't against it but he wasn't encouraging her. So he's not a technophobe but he's not, he uses it when he desperately needs to, that kind of thing. he's more a, he's a stone carver, chisel and hammer kind of guy. [Andy 1 Group 2 : 663 - 663]:

Another example is the tension between Bob and his ex-wife, and with many other people who take advantage of his expert knowledge:

> She's got some stuff doing Macromedia programming, that's beyond Ross I think. Macromedia is more like a program itself. She does more IT managing things, and she

> gives you something and she doesn't realise that if you haven't done it, you have to learn how to do it to actually make it work. [BOB 2 Group 4 : 44 - 44]

Many of these problems and disputes can be seen as the clash of alternative interpretations of particular ICTs, and the power of one person to impose their interpretation on another. In the case of John and Dorothy, she had accepted the computer as necessary for his studies, but the Internet did not appear necessary at all, from what she had seen of it. John is enthusiastic about the new technology, and could see uses for it, but felt obliged to accept his wife's verdict. Mary also over-ruled Terry, who had brought his computer with him when they got married: she really could not see the point of him using the machine at home at all, and certainly was not going to let him spend their money (I never found out if she changed her mind after having to learn to use the machine to get a job).

These problems occurred over the adoption or use of an ICT. A different sort of problem is raised by Dorothy (Group 3), where she feels excluded from conversations about IT when her son-in-law or brother come to visit, when she leaves the room and gets on with other things. Although they were not interviewed, Trevor's wife, and Andy's sister both described as being uninterested in computers, but Trevor and Andy frequently talk about computers when they meet, and Andy doing the same with his brother-in-law. Even in these small groups it is obviously a topic that currently interests the men more than the women in these groups. (It is not the first time that men talk about something that excludes their partners either!) However there is another example, Maura and her children use computers at home, but her husband is not at all interested in the topic, but unfortunately we do not know his opinions first hand. Being left out of a conversation or bored when the conversation turns to technology is a problem for others as well. Amanda and Fiona (Group 1) both 'switch off' when certain friends start talking about computers and find it very boring. Fiona switches off when her old friend visits from London and starts talking about the fancy computer she uses.

7.5.7 Everyday Usage and Frustration with Limits

As well as the ongoing technical problems and interface problems and the relationship issues addressed above, there are other problems that the respondents faced in their everyday use of some ICTs. These are frustrating limits of technologies and institutions that are not quite up to standard of service of function that the user would like, or need. One problem is trying to get technologies to work together when they were not really designed for the job, as Aiden explains:

> Yeah, just comes through the TV. It's good. I've got a mobile personal CD player thing but it's a hassle setting that up and plugging it in and plugging separate speakers and all that in you know. [Aiden 2 Group 4 : 662 - 662]

The upshot of the bother of wiring the CD up means he does not use it very often, instead watching TV, playing video games or playing the guitar.

Insecurity over doing things right and possibly losing data constantly worried Amanda (Group 1) the first year she had to write school reports on the computer:

> Well the first year it was a nightmare, just the thought of you know having to do it all, having it on disks. I was saving about four copies on floppy disks in case I lost it. Em, that was the first year I did it. Last year I did it and it was much easier. I was much more laid back about it. [Amanda2 Group 1 : 66 - 66]

She made up for her insecurity over using the machine by making multiple copies of the disks...a technical solution to her own fears and negative expectations.

The place where the technology is situated is not always suited to the task it is being used for. Bob goes to the free cybercafe to download software, but finds the ambience not altogether ideal to him to do what he considers work:

> I find it annoying when I go there now, because you get wee kids coming in. I'm all for them using the Internet, but basically all they're doing is talking to each other using email! [BOB 2 Group 4 : 86 - 86]

This is in contrast to Noel (Group 2) who finds it hard to write at home or in the office, and so fixed the problem by buying a palmtop computer to use in cafes and on the train.

Lack of facilities at work can be a constant irritation and problem for some people who are expected to use computers.

> I could certainly use it [the Internet] if it were something that were provided at work. The only problems being in having the money for the equipment that enough children could use it. It would be difficult if one or two, whatever it is you use, links, and you know trying to get 200 children to be able to use it, so timetabling that kind of thing, that would be a problem. [Valerie 2 Group 1 : 415 - 415]

Many of these problems lead to constant frustration with the limitations of the system and technology. In the case of some of those who are working with computers and the Internet there is a frustration that the machine will not do enough, that they have reached the limits of its power. Andrew (Group 2) speaks of his struggles with the limitations of the machine he was using, for example[168]:

> It was becoming a necessity. Because my old system was a 386, with a 200 Meg hard disk and it was constantly running out of space. 8 Meg, which was at the time I bought it in 91, it was a good system, but by last year, when I was doing multimedia here, and at Dundee, I couldn't work on my work, I couldn't carry on at home, the system was inadequate for the job. Essentially the work I was doing forced me to buy it, but I had been wanting to upgrade it for a couple of years anyway.... [Andy 1 Group 2 : 359 - 359]

Some of his problems could be solved by money, which he did not have. Others were just the limits of the technology as was then available. His lack of money, and his expectations of what the technology could and should deliver created a constant feeling of frustration and ambivalence towards his computers, which otherwise he found very productive and inspiring.

Trevor (Group 3) had similar problems, and is a good example of the expectations of the technology outstripping its ability to deliver, and the constant need to increase his computer use as his business expands, and the technology develops to support new functions in design and communication.

> I need two computers. I'm finding it more and more it's sort of irritating. I think we need one computer for Internet and stationery work and another computer for kind of graphic work and desktop publishing work and I think, yeah I do, I think Liz needs another computer again for her own work, for mail outs and such so we've got to be very computer intense soon. Two years ago we were quite comfortable in what we had. And it's also we're both in the business of mail outs, multiple mail outs and all that kind of thing and it generates itself ... . It does feed itself. [Trevor 1 GR 2 : 165 - 165]
>
> You do more and then you find that you start looking for a machine which can do that bit more and you start to get a nose for it and how it can help and assist you - I don't even think half the time, I don't think in business terms whether this can make a profit although

> I'm sure it comes into it. I just think will it make my life easier, would it make my life are there some really trudgey tasks and things that I have to do within the business context which will make life a lot easier which ... does have economic benefits as well. And I find that when I do graphic work, digital work, image manipulation, God I wish I had one that was faster. And the faster they come, the more interesting I am in getting one. But not necessarily all singing, all dancing with AV facilities and editing facilities and all that because I don't use that kind of em, not that I never will but it's just that I don't go in that direction. [Trevor 1 GR 2 : 168 - 168]

He finds himself in a vicious circle, with use of the technology stimulating new possibilities which make him frustrated with his existing equipment and oblige him to invest in the next generation of technology[169]

Not everyone is able to buy the latest equipment, so has to put upwith machines that are getting old. Neil and those in the multimedia design office had computers that had become ‘too old’, and found these frustrating.

>]Not really, the problem that's been affecting Mark and I is that the Macs are very old now, they're over 6 years old each and they're starting to show their age. That's one of the reasons they had to change. These projects are coming in and we can't take them on. That's been the main problem. [Neil2 Group 2 : 167 - 167

Lack of common standards and compatibility gave Maura problems when they wanted to take work home:

> Em, mainly to - when I had a PC at work I couldn't sort of transfer work between home and work and I'd been thinking about getting a better one - well I use it and I need something at home and em, I knew that it would be useful for the kids for their work. [Maura 2 Group 3 : 17 - 17]

This compatability also frustrated Andy who worked with a Mac in the office, but had a PC at home.

While these problems limit the usefulness of the technology, an interesting problem that was mentioned in the section on relationships is spending excess time on a computer, especially games.

> No, and also I knew myself I'm just too addicted to the damn things when I get going. But then I don't do the video games, the blasting ones, it's the sort of the real life kind of fly a plane or sink a few battleships from the bridge of the Nautilus or whatever, that sort of stuff. They're just too much. I had a came of Civilisation which is ongoing, ever going, build a civilisation and you are the master of it all. Oh no, get rid of it, it's too, on the verge of revolution so I took it off. No, they're great, I do they're great. So when I initially said "No" it's because I can but. [Trevor 1 GR 2 : 220 - 220]

It is not only games that can be ‘addictive’, but problem solving, designing and other uses of the computer can keep people up all night, and working for days without a break.

A technology that was constantly frustrating to users and non-users alike was the mobile phones, and it is worth seeing the range of problems that even this small group had. Non-users and users alike find other people talking on the phone annoying:

> Dorothy: It has no part in my life, but I can see it has a part in some people's life. For a lone female doing a lot of driving, they're good. But they're an abomination in a train if you're sitting minding your own business and you hear yack, yack. [John Dot 2.2 Group 3 : 45 - 45]

> Only one person, one friend. And I tend not to, it's one of the women up in Inverness, the technician who was very supportive to me and she's got a mobile but I tend to 'phone her at home or at work because most of the time the mobile's not receiving. So basically no. That's the last number I'll use. I'll either try her at home, usually I only 'phone her at night anyway when she's at home or I'll 'phone her at the workshop and then the mobile would be the last resort. [Andy 1 Group 2 : 775 - 775]

Having to manage using a mobile can be problematic too, as Maurice found, continuing his problems with actually trying to get it to work and find a signal to use it with:

> For a long time I never gave anybody the mobile phone number at all, I still try not to and the reason is because there's long periods when I don't turn it on. ... when I'm away and it's a pain to have to remember to turn it on and pick up messages from it so for a long time I just used it to forward from the office phone and I just put a forward on when I was out. That's what I should have done today really but I just gave somebody the number. But I don't like doing that because on one occasion I actually lost a job because they'd rung my mobile and I hadn't turned it off for a couple of days ... needed and so I really want to go back to the philosophy of saying, of not giving out the mobile number. But of course that's expensive because if they ring the office phone and it gets forwarded to here I've made ... charges so that's a not very good system. But in principle I'd like to have one number that they can contact and my business card for example doesn't have my mobile number on it and that doesn't bother me. [Maurice 1 Group 3 : 816 - 816]

All in all, the mobile phone brings Maurice a number of problems that he is unable to resolve, due to the limitations of the technology, his own lack of discipline in conforming to the demands of the technology, the poor service, and his unwillingness to pay.

The answering machine is another technology that gives usage problems. Some people may not like to talk to a machine (Mike and Helen, Group 1), or like the machine talking to them, (John and Dorothy, Group 3):

> I don't know if we told you the last time you were here, we gave up the GPO call answering service because of the snooty voice! Even today, I phoned someone up and after a while this female came on. I shouted at her! [John,2, Group 3)

Andy just found it frustrating trying to get in touch with his friend only to find the answering machine, and not being able to leave a phone number to call back.

> I 'phone Trevor I keep saying what's your e-mail address. I think he has got an e-mail address 'cos I'm sure he's connected to the net but I don't, maybe I should start e-mailing him instead of getting his bloody answering machine or get more, more, more feedback that way. There's not much feed back from an answering machine. It's becoming a bit of a joke actually, it's just every time I 'phone him up, it's the answering machine, where the hell are these folk. I mean Liz works, she's a felt make, she makes felt hats and everything. She works from home most of the time, not all the time, but I mean I think at least Liz, unless she's sort of listening to, "oh it's that bastard Stenhouse, I'm not picking up". [Andy 1 Group 2]

Andy's main problem is not having his own phone, so his friend's answering machine becomes an annoyance rather than a help, as it does not help him get in touch with them at all.

John and Dorothy had problem trying to use systems which needed a PIN – such as the ATM (cash machine) and the calling card system: Dorothy could not remember her numbers:

> You see that Coins and Cards? When the card system came out, I bought a card because I was working away sometimes. We used to give a card to our grandson when he was at Stirling for his calls home. University call boxes are ankle deep in old cards. But I gave it up because I couldn't remember my pin number and I knew there was a long string of numbers you had to remember and put in the correct order. [John Dot 2.2 Group 3 : 34 - 34]

Luckily there is an alternative for the bank, going to the branch, but not for this telephone service. The only strategy is to give up using it.

A final issue that was raised by John (Group 3) in reference the Teletext interface, was the frustration with getting stuck with a technology that is not flexibile nor does what you would like it to do, either because of the standards or the limitations introduced by the service provider. Aiden faced two limitations of this nature with his entertainment technologies. He lives with the frustration of not being able to buy games for this console, and frustration with himself for buying the 'wrong' machine.

> Yes, now that I have had it a while, I would have preferred to have a PlayStation. There are a couple of games on that that you can't get on the PlayStation, but PlayStation more than makes up for it because there's such a vast range of games. [Aiden 1 Group 4 : 502 - 502]

The cable TV company has very limited way of providing services, including the bundling of channels into ‘packages’, which annoys Aiden, and does not make any sense to him as a consumer.

7.5.8 Upgrade uncertainty

The decision about when to upgrade a technology, and how, as facilities, functions and price are constantly changing can be a difficult decision. Many of the current users of ICTs faced the decision to upgrade or replace their equipment as they become frustrated with its limits, or it became unsatisfactory in some other way. Others just want to have the latest technologies in order to try and exploit new functions and facilities. Trevor explained above how he felt he was stuck in a vicious circle, with his imagination and needs continually surpassing the technology he uses However the upgrading then necessary causes him more problems, especially dealing with the uncertainty of technical change and standards.

> But now I've got one [An Apple Mac computer] and got all the software and everything for Macs, it's difficult for me to transfer over to PC but at that time all the bureaux, because I take some of the stuff to printing labs and such like and 90%, 95% of them at that time just said Mac. If not Mac only, then it would be a lot easier if you've got a Mac. It's all that kind of stuff and the printers in Inverness, even Fort William who I use is Mac. "We've got a PC but we don't like using it." So I was kind of pushed into getting a Mac but I'm not a Mac, because I've been lucky being able to use both at work and at home I'm not a Mac fanatic and I'm both systems have got their strengths and both have weaknesses. the biggest strength of the PC is it's so cheap and affordable and there's a lot more kit available. The strength of the Mac is it is a, it doesn't crash as much, it's much more reliable, it's and the latest ones are much faster, powerful but it is a lot more expensive but you don't have to be as techy with a Mac and you spend much less time figuring out what the hell is going on. The biggest compliment was when I had PCs at work so and I could still use other people's PCs ... but the biggest compliment was somebody said "You don't want to get a Mac, even a child can use a Mac." Yip, that'll do. So there's strengths and weaknesses on both sides. But I know that Liz likes the Mac but I don't have a, what you would call a product loyalty or anything like that. Plump for one or the other. [Trevor 1 GR 2 : 180 - 180]

By the second interview he had decided to upgrade, but was balancing the cost of buying a powerful machine against the risk of early obsolescence.

> I'm about to, this is the other catch. Not only the obsolescence, but it's how big a machine you need to deal with it. [Trevor 2 Group 2 : 24 - 24]

Dealing with the proliferation of standards and technologies is a headache – balancing the pros and cons of various technologies, and trying to guess

where the technology is going in the near future, as well as what will be most useful.

> I think I will yeah because I'll get paid for these two projects so I'll take the opportunity of the money that I'll get from these projects to. I think upgrade the memory is a must and I could even do with a bigger hard disk already. I mean that's just less a year, or maybe, I'm thinking whether, I think probably what I might do is get a jazz drive. I've got a zip drive but a jazz drive's more useful, you get a gig on it and it's almost hard disk speed so you're not, it's almost like a slightly slow hard disk. So although I'm not sure whether it's a good time to be buying that because the universal serial numbers, all the rest are, all that sort of area is beginning to move slightly towards. [Andy 1 Group 2 : 379 - 379]

In the case of Andy and Trevor there was a clear need to upgrade their existing machines could not do what they wanted them to do, or they were becoming too unreliable. In other cases there was no pressing need to upgrade or replace, but new functions and possibilities were opening up, making the machines easier to use with the option of uses such as the Internet. Fiona (Group 1) used an old Apple Mac Classic which she was considering replacing:

> Well we're just waiting for Ian to make up his mind and each time he reads another magazine he says something else better is going to come out. So when that comes out there's always something else after that. But eh, I just feel - we've got an old Apple Mac and I just use that as a, for what is it, word-processing. And use forms and things that I make for myself. That's it. [Fiona 2 Group 1 : 49 - 49]

Uncertainties about costs and problems can keep people from adopting, such as John not linked to the Internet, and Terry (Group3) deciding not to get a PC because of the risk of computer viruses from the Internet. Past experience of viruses at work led Terry to expect problems, and judge the risk to be too great, even though he could get a computer for £15.

> At the moment we're not using the PC upstairs for much. I don't know. I've often thought though if I'm still debating whether this is worthwhile or not, if we ever decide that we would like to make use of the Internet, I've always to have a separate PC for Internet and nothing else, on it's own, free-standing, rather than have a machine that you're using for other jobs and that because I'm paranoid about the idea of unwittingly importing some bug, a virus into the system. But if you have two machines, particularly one that you've only bought for £15 it's not a great disaster if you do get a virus and the whole thing crashes and you can't fix it or whatever. But it would be awful if you lost all your files, publications for example, because of some virus you've brought in through the Internet. But anyway this is still to be decided. At the moment I don't really miss not having access to the Internet. [Mary and Terry 2 Group 3 : 198 - 198]

In these cases there was an expectation of problems, and the resulting uncertainty led to the decision being put off. However it is not always possible to foresee problems that subsequently arise. In some of the cases

there were examples of bad decisions in upgrading or replacing, such as Aiden buying a SEGA Saturn, and finding the format unpopular, as was illustrated in the chapter on Non-adoption. For Aiden this mistake cost him money and he can not get the games any more. The experience really put him off spending money on constantly changing technologies.

The constant technical change and the proliferation of products increases choice but it also increases risk. The feeling that you are throwing away money can be a powerful incentive to put off purchase, or go through the informal economy – buying second hand, sharing, or borrowing. There are also other ways of dealing with the uncertainty: find out maximum information to minimise making the wrong decision, consulting experts and expert groups, wait for the next generation of product to come out, delay adoption until it is absolutely necessary to adopt, wait until the latest version of an innovation has become stable and reliable. Other strategies to minimise risk include proxy factors such as selection by brand, or buying the most expensive or most powerful machine in the hope this will reduce the risk.

7.6 Strategies and tactics: coping with problems

(Otnes, Lowrey et al., 1997; Mick and Fournier, 1998) suggest that we develop strategies for dealing with the problems and ambivalent feelings we encounter as consumers. This review shows the range of problems encountered, and reveal a number of strategies or tactics that these people used. In the following table I summaries the strategies that I saw people adopting in relation to the problems illustrated earlier.

Non-adoption	
	Avoidance Active resistance Delay Leaving adoption to others in network
Purchases in the expectation of problems	
	Careful information search Only buying from trusted brands Passing responsibility to others Developing relationship with supplier
Learning	
	Working carefully through the manual Attending courses Always asking for help Having a go…
Problem Solving	
	Self-reliance Calling on social network and local expert Going through formal/commercial channel
Social Conflict	
	Creation of rules at early stage of adoption Backing down Compromise Trading Imposing will
Technical problems	
	Look for a technical fix, Go to local expert Give up Replace technology
Dealing with suppliers	
	Accepting it as inevitable Facing down suppliers Changing supplier Going to a trusted local expert Developing relationship of trust
Dealing with uncertainty and risk over technical change	
	Spend as little as possible Spend as much as possible Share risk in network Consult local expert Information search Delaying adoption

Table 16 Coping strategies in consumption of ICTs

De Certeau (De Certeau, 1984) introduced to cultural studies the concept of tactics as the consumer's way of subverting or dealing with the strategies of industry. It is now clear that in many cases industry is far from strategic in its

innovation and marketing of new products and services, having to deal with uncertainty in technology and the market through tactics such as taking advantage of opportunities, and making do, although constantly looking for a locus or pole of attraction to give the strength to develop a strategy. Can we see the contrary in consumers, with consistent and grounded strategies for dealing with innovations, as well as having to deal tactically in response to seemingly uncontrollable industry offerings? To a certain extent this appears to be the case. There are undoubtedly many case of people having to make do, or engage in 'bricolage' not only personally, but also as professionals in organisations that are struggling to deal with technical change. However there are many situations where people have well developed strategies for dealing with the world around them, whether they are dealing with local problems, or coping with unavoidable situations including the 'march of technology'. In appropriating technologies we are not entirely opportunistic or without our own personal social and physical space (De Certeau, 1984) in which to deal with technology on our own terms. Our home, the social network, our neighbourhood, our everyday routines, our accumulated knowledge and experience of earlier change give us a certain amount of strength. For example, those with more experience of technologies have already developed the strategies to deal with technical problems, others are better at dealing with social problems, and others have better strategies of dealing with uncertainty in the market. Over time we develop sophisticated attitudes to the place we see technology taking in our lives, and scripts to deal with change (Hirschman, 1980). Beyond specific tactics developed for particular problems we use these generic strategies, such as using the local network, information search, delaying and rejecting and using formal channels for help which can be applied to many different situations. They reflect basic attitudes and values, such as self-reliance, or a preference for solving problems with the help of others[170].

How these strategies are put into practice demands a certain amount of creativity. For example, Maurice looks for his own technical solutions to

problems, which means leaning out of the window to use the mobile phone. These strategies are also applied in a hierarchy depending on the individual and their judgement of success. Those who prefer to be self-reliant, such as Fiona (Group 1) or Maurice (Group 3) will try the sort of strategies that they can implement themselves. Other will always consult within the network, others will go to though market or formal channels. Choice of strategy also depends on self-confidence, and on the confidence and trust placed in others. There are some benefits from being an ‘expert’ with technology that enable the most appropriate strategy to be chosen. An experienced user will be able to judge the value of the help they can get from a commercial provider compared with other sources of information, something that someone with no experience dealing with ICT suppliers will be less equipped to do.

One common feature of all the problem situations was the role of local experts who could provide a range of support in dealing with problems, and helping to develop appropriation tactics and strategies. In the next chapter I will examine this role.

Chapter 8 Local Experts

8.1 Introduction

During the course of the research I started to find that not only were certain people enthusiastic about new technology, using it and developing skills ahead of some of their immediate social network, as would be expected, but these people were also active in informing, supporting and promoting new ICTs within that network. These people were not necessarily IT professionals or engineers, but they had come to be, and were seen to be, innovators and experts on the use and application of ICTs relative to others in their network. This conclusion comes from several sources.

The idea came initially from my own experience. Within the University department I was one of the more engaged and interested in new computer technology, and spent time working on it, researching developments, and then informing and helping others in the department. There were professional sources as well, who could set up machines and sort out established problems, but for the developing Internet, and new products I had more expertise, and was able to pass it on. Among some of my friends and family I played a similar role. For my mother I encouraged her to buy a new computer, and spent time explaining and helping on the phone and on visits. For friends, I could talk about the Internet, explaining what it was, choosing software, service providers and helping set up web pages. At the same time I became part of a network of people with similar interests which I could share and develop ideas and uses, which I could pass on to others with less time, experience or enthusiasm for the Internet.

Second, in studying and comparing the development of the World Wide Web and interactive television, the success of the WWW due to the role of enthusiasts appeared to be remarkable when compared to the failure of a number of large scale corporate interactive television projects (Stewart, 1999). The WWW was built by enthusiastic hobbyists who first made own

web pages, and explored the Net. Many then persuaded their companies and departments to invest a little in web development, informed colleagues and friends about new uses and web sites and played a key part in stimulating growing use and publishing well before commercial promotion became important. Some of these people then went on to become successful commercial entrepreneurs too.

Third, the research interviews showed that there were individuals in the groups who were perceived by themselves and others as important local experts, who were relatively early adopters of ICTs, had a positive attitude to their usefulness, and provided information, knowledge, expertise, equipment and services to others in the network. These examples provided the basis for a more thorough exploration of the idea of 'local experts'.

Fourth, research in the SLIM (Social Learning in Multimedia)[171] project highlighted the role of innovation and appropriation 'intermediaries' across a range of multimedia technologies. In particular, this work showed the importance of 'appropriation intermediaries' in the local implementation, uptake and use of multimedia. These were often enthusiasts who turned their interest into professional work, and who worked at a local and personal level in promoting ICTs, sorting out other people's problems, experimenting with the relevance of particular technology to their local network and professional activities, innovating, researching outside their own field and bringing this knowledge in and trying to apply it.

Finally, debates over the role and characteristics of role models, opinion leaders and knowledge brokers from the adoption literature showed that there was a need to explore in more detail how and why some people appear to play an important role communities in bringing knowledge in, and influencing the diffusion of innovations within that community.

These sources convinced me to try and build up a picture of who 'local experts' are, how they get to be expert in terms of social role and technical knowledge, what they provide for their local network, and how this influences

or benefits the network. Of particular interest for this study was that they also appear to work across boundaries of work, home, generation etc, a key focus of the research. The local experts also tell interesting stories of their own adoption and innovation. They demonstrate the importance of informal networks: the fact that people are able to tap into the expertise of those they have an everyday relationship with showed there is a route for opinions and knowledge to reach almost everyone via a word of mouth. Local experts are central to the informal economy, providing information from personal experience and the technical media, practical services and advice, and equipment. Local experts also appeared to act as a link between the adoption process and the process of learning and coping with subsequent technical change in a complex and difficult product area where support and sharing of experience is necessary.

A LOCAL EXPERT: MAURICE (Group 3)

Maurice is an IT professional. He works as a commercial teacher lecturing to systems managers and programmers on Unix, Java, and many of the latest software and programming languages relevant to the Internet and large-scale computing systems. He is also developing his own multimedia product for the domestic market in his home office. He reads lots of computer magazines, and uses the Internet for research. He does not have close contacts with others doing similar work to himself. He is a local expert in computers, and is confident with technology. In his immediate family Maurice is the computer expert, and is responsible for the machines. His wife and children turn to him for help with IT, as does his father in law. His wife's friends know him as a computer guy, a definition that seems to set him in a class apart. His wife Ruth has long resisted using computers herself, and living with him, she is able to off-load any responsibility: he does the typing for her, he organises the children's computer, he runs the family e-mail system etc. He is thus a great resource of knowledge, service, organisation, and enthusiasm. He also helps his father in law with his computer, his mother in law thinks he must think they are a bit stupid, and praises his patience with her husband. He has some contact with others with similar interest though his work and local trade groups, but much of his knowledge comes from the media, books and hands-on experience.

8.2 Background to Local experts

Recapping some of the theoretical background, there are a number of theoretical approaches, and associated empirical fields that point toward the idea of ideas of the 'local expert'. Research on opinion leaders, opinion brokers (Burt, 1999) and intermediaries (Stewart, 1998; Williams, Stewart et al., 2001) seemed relevant, but ideas of constituency builders (Molina, 1993), change agents (Gatignon and Robertson, 1985), intrapreners, other innovation studies concepts also appeared to be mirrored here although on a considerably smaller scale than the industrial fields in which they were proposed. The local expert is an important as a gatekeeper and interpreter of external expertise which they can evaluate in the light of the knowledge they have of those they aid in their local network.

Another source of relevant empirical and theoretical literature is the study of word of mouth communication and influence in social networks, particularly for the adoption of innovations. Word of mouth studies (Katz and Lazarsfeld, 1955; Johnson Brown and Reingen, 1987; Abrahamson and Rosenkopf, 1997) show that this is the dominant way that most people find out about innovations and assess them, compared with influence and information from the media. Certain members of communities and networks use media sources and hands on experience to judge innovations, experiment with them, and promote acceptance or advise rejection. Rogers suggests that early adopters of products tend to have a high degree of opinion leadership and can thus act as a *local missionary* and maybe a role model. They know how to retain in a central place in communications in a network, and make adoption decisions that will be respected. Within a community they supply subjective opinions, thus reducing community uncertainty (Rogers, 1995).

The local expert appears to exercise some of these functions. Literature on the diffusion of innovations and the adoption of products and services puts great stress on the role of opinion leaders as a particular type of change agent. Opinion leaders can provide information or they can provide legitimacy as a role model, or both. Their expertise comes from a special

interest and earlier adoption than their network. They tend to be more educated, have more material resources, be ‘cosmopolitan’ i.e. have a wide heterogeneous social network (recalling (Granovetter, 1982)) and look for ideas outside their immediate community (Rogers, 1995). Opinion leaders tend not to be the most advanced or innovative, but can be a little outside the mainstream to command respect. Latest research on opinion leaders moves away from the idea of opinion leader as setter of trends and moral leader towards the opinion leader as an opinion broker (Burt 1999). Rather than being at the centre of a network, opinion leaders are actually on the edge of several networks, and act as a bridge between them. This gives them their ‘social capital’ that also gives them status within the group on matters where expertise on matters outside a network are important.

The trust people put in an expert derives from the expert knowledge they have, and also their connection to other networks. One issue is to discover what influence a particular person has, with whom, and in which domains. Opinion leaders can have this role within particular categories of knowledge or behaviour, but not in others. While the computer expert may be the opinion leader when it comes to making choices about buying a computer, for all other activities and opinions they have little power.

Finally, looking at domestication studies, the approach of local experts gives a different slant on the divisions of expertise and interest in the family, and the cohesion of various members of the family with groups outside. The family expert is a link to more expert groups outside, and acts as conduit for knowledge into the family. Within the family they may become the person to whom other members of the family pass on the responsibility of developing skills and knowledge, abrogating the need to do it themselves. This may be convenient, with the expert and the others happy with the arrangement. The imbalance of course may not be voluntary, and instead of being a practical division of labour can lead to problems of exclusion and alienation. It may be to the disadvantage of the expert, loaded with extra tasks. Alternatively, and particularly in the case of ICTs, where domestic experience can be applied

outside the home (especially in employment), it is possible to envisage the presence of a family local expert as a hindrance rather than a benefit. Different levels of expertise within a household, and links to various experts outside the household can influence the emergence of different interpretations of ICTs by household members, and the control over adoption and use.

8.2.1 Initial Observations

One of the hypotheses of this research was that new ICTs had become common enough that everyone would know a user, an expert, professional, or enthusiast in some sort of ICT, even if they did not use them, had no resources, or were not interested themselves. I expected these people could have some sort of influence on knowledge and opinions about, and access to these ICTs for non-users, light and notice users. At the time of the study, in 1997-9, 'ordinary' members of society were coming into contact with new advanced ICTs in a range of diverse activities and locations, and through the media[172] It would be very unusual for an individual not to know anyone who did not use some sort of contact with these innovations. It became clear that some of those who had more knowledge, were regular users, earlier adopters, had greater access to and experience of ICTs and so on, appeared to play a special role as an expert for those around them. These people were constantly referred to by others in their network as important sources of expertise. These 'experts' had three main features: they provided help in dealing with practical problems shown earlier, and general background knowledge; they were not necessarily highly knowledgeable or skilled, but *relative* experts to those around them, and they were generally not role models, but demonstrators and sources of information from sources outside the local network or activity area.

As has been shown, there are many problems and choices encountered in adopting and using ICTs, and even for non-adopter or non-users, ICTs are becoming an important enough part of the economy and society, and the lives of those around us, that we need to inform ourselves on some issues.

While there are many professional and commercial services available to help, these also are the source of some of the problems themselves. Newer ICTs are also expensive, it is useful to look for bargains, get second-hand equipment, share resources, copy software, borrow when necessary, all of which needs a community of users to interact with[173]. A support network of other adopters and users has been recognised as an important factor in adoption and deal with the uncertainty and complexity of new ICTs. The more experienced members of social networks seen to play an important complementary role in dealing with innovation. The existence and reference of others to these people raises the prospect that informal contacts could be central to overcoming the problem of 'exclusion' from new ICT use.

Local experts are *relatively* expert for those who consult them. Their expertise is activated by others in the network when they start to show an interest in the technology for other reasons, such as problems with adoption and use or the desire to form an opinion. This activation can include asking advice, help, asking for services, equipment etc. Only a few people in the network have to go to the expert for the others to start recognising them as the expert. Outside of the local network, the expert may in turn consult other experts.

The expert can also act as a demonstrator to other people who share similar values, resources or 'lifestyle' (equivalents) in the network, showing that it can be relevant to their lives, that they can learn it and deal with new technology. Contrary to this, some people may see their local expert as being rather different to themselves (e.g. young v. old, rich/ less well off, technical mind/non-technical person) and therefore not examples to follow. Instead the expert is a source of practical knowledge and information, and maybe of role models outside the network.

8.2.2 The Informal Economy and Local Experts

The local expert would appear to be an important part of the informal economy discussed in the previous chapter. Generally we consider experts

to work in the formal parts of the economy or an organisation, and in many cases local experts within a market or organisation are fulfilling a formal role. However, frequently local experts are found to be operating outside of the formal economy or organisation. Indeed it could be argued that they are the principal source of such provision in everyday life. They are providing expertise that the market or formal structure provides badly, and are available to help people though the difficult process of learning how to use new technology, developing knowledge to make decisions, and coping with continual change. Even if a organisation provides formal training course and has an official help service, it will be very common for someone within a workgroup to assume the role of local expert in ICTs, due to their greater experience or interest, and willingness to share this with those around them.

Outside the workplace, the local expert is perhaps even more important. Local businesses and the media can provide expertise, but it is seldom available when it is needed. Moreover people are often not willing or able to cover the price of commercially provided expertise[174] The market cannot provide the sort of support and channel into the everyday lives of people who are starting to deal with the ideas and the practicalities of innovative ICTs. Local experts can be members of the family, friends, neighbours, members of clubs and societies, churches, pub communities or any social group.

8.3 Who are the Experts?

In the interviews I asked a number of direct questions about whether the respondents knew people who used and worked with computers, if they talked about new technology with other people, and with whom. Everyone mentioned individuals that they knew, either directly or through friends and family. Sometimes a particular individual was mentioned by several in the group, pointing to them being a recognised expert within that group. Sometimes others outside the group were mentioned. Some of the experts I was able to interview, as they were part of the original groups I had found. There is obviously some risk of bias in the sample towards groups that

contained experts, but even in Group 1, where there were no people that could be called heavy IT users, all the respondents knew someone who they could ask for advice or information, and a ‘real’ expert was only one person away in the network.

8.3.1 Group 1

In this group a number of people were named as local experts. Amanda had a flatmate who studied computers and tried to get her to use e-mail. Her uncle was also a source of information and demonstration about new media technology such as multichannel TV.

> He's one of these sort of people who gets everything when it comes out. He's got a huge long like screen and three video recorders and got cable and he's got all the surround sound and everything. [Amanda2 G1 : 124 - 124]

At work Amanda and Valerie could turn to the school computer co-ordinator for software information and solving problems[175], although Valerie is one of the more experienced having taken a course several years before. Both Valerie and Amanda had other friends who used computers and the Internet, but they did not talk about ICTs with them. Valerie and Amanda both pointed out that in their primary school some of the children, who had computers at home, acted as local experts for the other children, helping them, giving advice etc.

> Valerie: if they have the basic skills and can come and ask for help if they need it or they go and ask other children in the class who they know more than they do and that's quite acceptable.
>
> James: Sort of class experts?
>
> Valerie: Yes
>
> James: Is that people who've got them at home or?
>
> Valerie: Usually it is, or some who are just a bit more confidant is usually the case. [Valerie 2 G1 : 433 - 440]

Valerie’s sister Fiona could turn to her brother in law, who also was a source for her mother, and for her children. Fiona also mentioned people in her climbing club and the person producing her company brochure as sources of information and help. In fact Fiona was a sort of anti-expert in her family, her children having used the Internet and regular use computers and video games, and her husband taking responsibility for much of the business use.

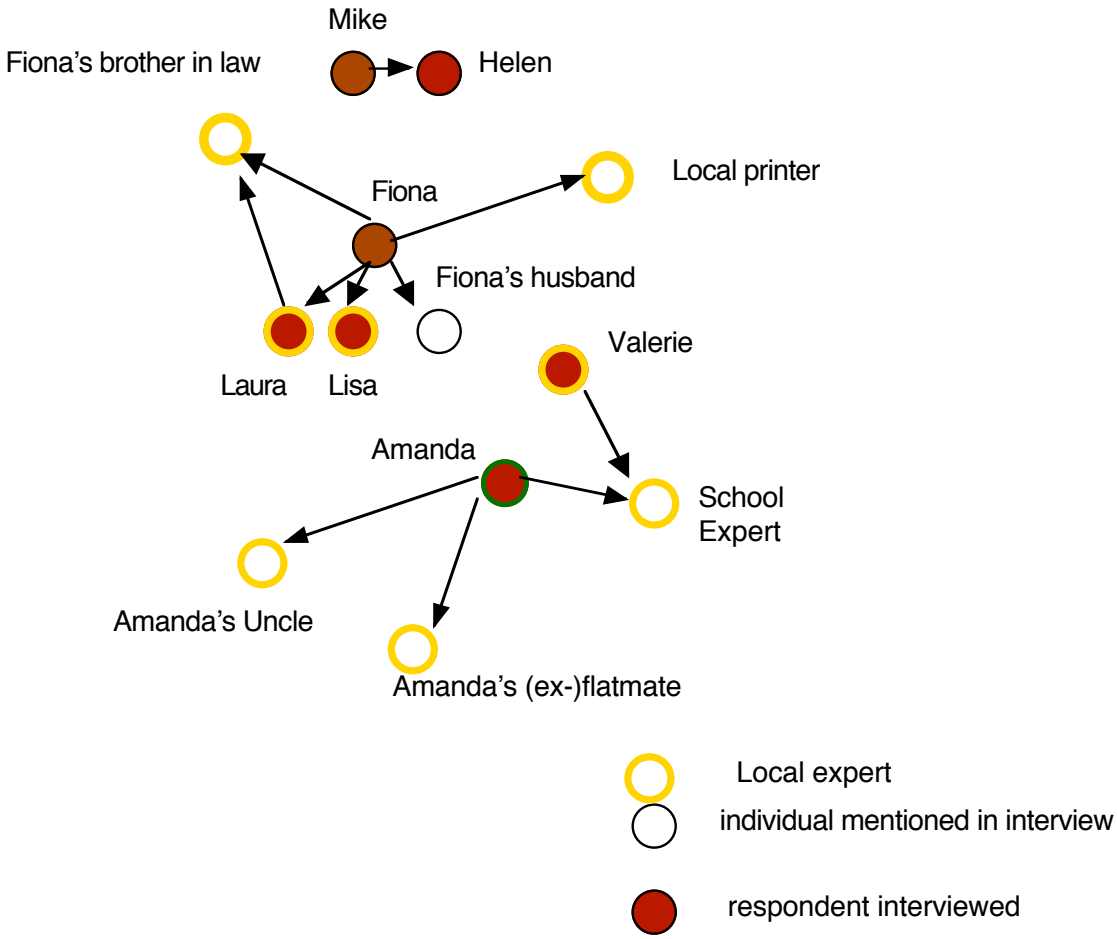


Figure 5 Group 1 Local experts

8.3.2 Group 2

Group 2 was based around the office developing multimedia and Internet products. Within the department Alec was the computer expert – he was responsible for programming and research, but it was also his hobby, and so he was the one that Andy and Neil turned to for advice.

Andy had learned about computers on a course, at home and at work, and had become an expert for his brother-law, family and friends, especially Trevor and Nigel whom I also interviewed. Although he was an expert to them, he referred back to Alec in his office for help himself.

Trevor, having been introduced to using computers for art work and learning how to use them for his art business had become an expert himself, using the computer for his colleague Nigel, and providing expertise and advice to local arts organisations and other artists.

Back in the office, Noel, the boss, was an expert in new media for the College management, and through this interest and expertise had developed his job and set up a department. He became increasingly in demand as an formal expert outside the college, moving to work part time in a national centre for educational technology.

Neil, the other member of the office I interviewed had friends who were not interested in IT at the time of the first interview, but by the second, they were turning to him for advice. Neil was also the expert for his family.

Group 2 Local experts

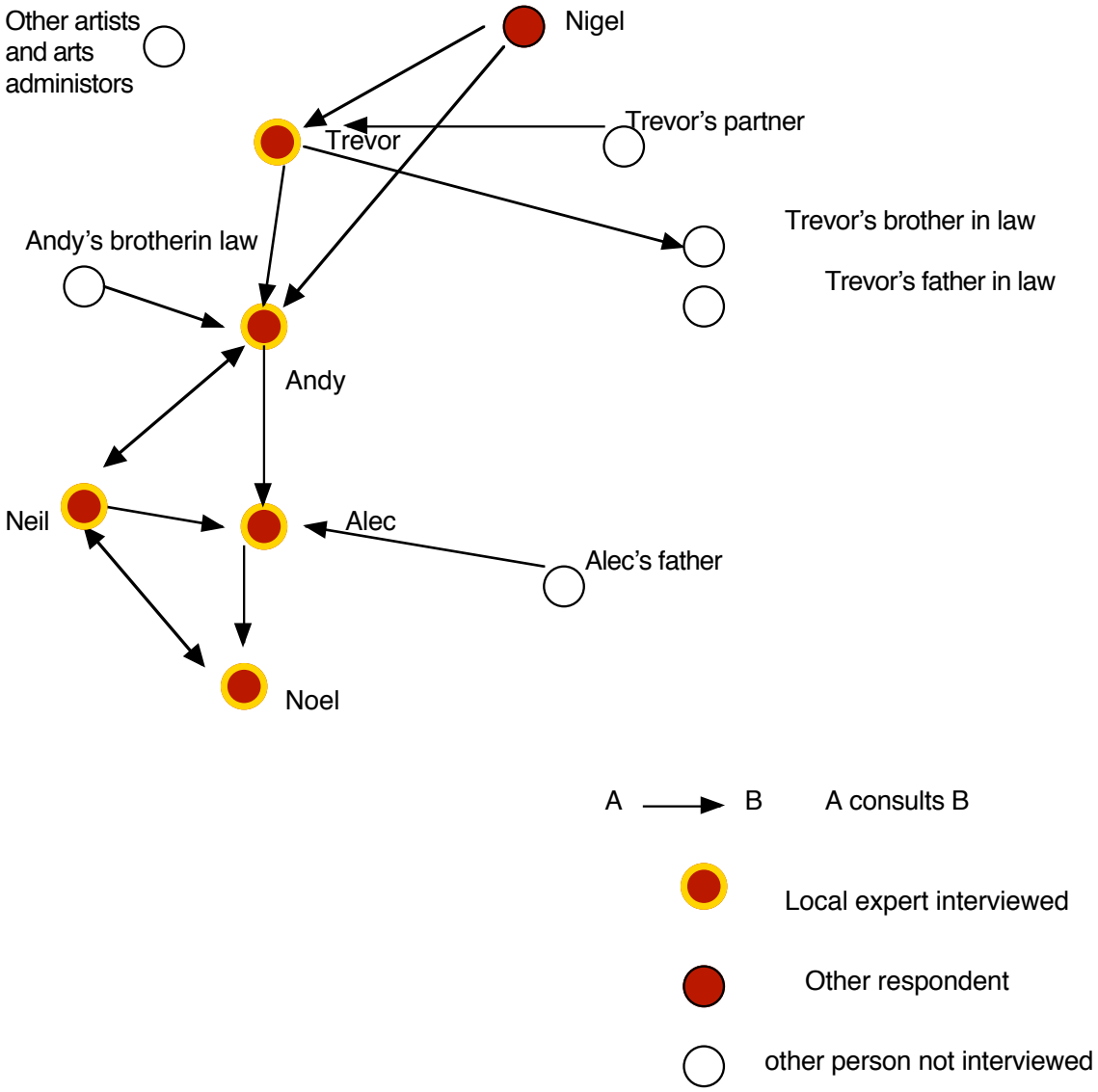


Figure 6 Group 2 Local experts

8.3.3 Group 3

In group three there were a number of local experts. My principal respondent, Ruth was married to a computer professional, Maurice, who was the expert for their family, Ruth herself, their children, his son, her children, and her parents. He was also known as the 'computer person' by her friends.

However Maurice is not the only expert in the family: his older son (14) who visits every two weeks is an expert on computer games and helps his younger brothers.

Ruth's father also had someone else to turn to, his brother-in-law in England, whom, despite being in his eighties was a keen PC and Internet user, and had given John a computer, and helps him with it, as well as telling him about new developments such as the Internet.

At the College where Ruth and her friend and colleague Maura worked there was an official computer support department. However one of the support team was also provided services outside his official role, such as finding a second-hand computer for Maura. Ruth also relied a great deal on a colleague in her office to type, use the computer and teach her the basics.

Within her family Maura is responsible for the computer, even though she is a relative beginner. She made the purchase decision, and though her work is able to be a home expert.

John and his brother in law both provide services to local community group based on their owning and using a computer to do secretarial task.

8.3.4 Group 4

Group 4 was the smallest group I interviewed. The father, Bob of my main respondent turned out to be an important local expert for his family, friends, neighbours and sports team. He is an expert on computers, programming and, electronics and many people would turn to him for help in fixing things, building electronics, or advice with computers. By staying at home to look after his children while they grew up, doing several college course and a range of freelance work he had time to help others.

Ross has a number of people to turn to help with computers:

> I'll try and work it out myself at first but if I get completely stumped about it I'll ask someone who looks like they know something about computers.
>
> Will the people you know who normally know?
>
> Well at school it was always my teacher. Here it's normally Geoff who's sitting in the little room [the technical manager at the cybercafe]. Or my dad or Michael's dad. Ken

> Michael's dad's got this big healthy computer, he's got everything. The guy's got more memory than… he has anything. Mair memory in his computer than he has in his own head. [Ross1 G4 : 981 - 987]

Aiden his neighbour's son mentioned his sister and brother and law as Internet users, but they could not really be called local experts. He also has a friends who spends lots of money buying the latest gadgets, particularly mobile phones, but his knowledge and enthusiasm was not really relevant to Aiden.

8.4 Making a local expert

In these networks the basic hypothesis that everyone knew someone who was an enthusiastic user of some if not many ICTs appeared to be the verified. In addition these enthusiastic people also had an important role in providing information, opinions, equipment, support and a model of a user. In short they could be described as local experts on new ICTs. These are people who others in the network go to for advice on new technology. Within networks these individuals are known as a source of knowledge and help. They are necessary at several stages of adoption and ownership in dealing with uncertainty, complexity surrounding ICTs.

Just having the knowledge is not enough, it becomes salient to the group when others start wanting to know, and needing to know about new ICTs. The more experienced individual then become a source of expertise: they take on the role of expert. For example, Nigel (Group 2) was bored by his friends Trevor and Andy talking about computers, but now he has to use them as their knowledge becomes relevant and he calls on them to help him. Mary (Group 3) was not interested in learning about computers from her husband, but when it became clear she would need to learn for her work, his expertise became relevant.

The role of local expert can then become a vital part of their identity for others. When Andy visits his brother in law, or friend Trevor they speak about computers, to the annoyance of the others around them. The same with Maurice and John his father in law: no longer are they only family relations,

but their relationship includes computers. Many of the relationships with these people involve a technology dimension that may not be present in other relationships.

These local experts were to be found in the workplace and in family life, and in other social organisations. Alec was the expert in the office of group 2, Maurice in his family, Bob for his neighbours and family. Within the workplace the expert could be in a formal position, such as Alec (group 2) and the computer responsible in Valerie's school (group1) but there were also examples where this was not the case, and the person people turned to in the first instance for ICT advice was not the person formally appointed to carry out this task, if there was such a post at all. In Ruth's office her colleague who had a computer at home was the first one she turned to as mentioned before:

> You see I've got a colleague who's a whiz on the computer. As she says she wasn't that bright school so she got to do typing, so she types at a phenomenal speed and therefore she does all the time tabling on the computer. She and I are both doing this management training together. I think I'm going to learn so much from her. She took me the whole way through, you know, sending emails and stuff and this new course [Ruth, Group 3 interview 1]

The workplace expert, formal or informal, could acquire that status from knowledge and activities outside work, as much as from experience and training in work. Alec had learned about computer from his life-long electronics hobby, Ruth's office expert gained her knowledge from home experience. New ICTs are one area of expertise where knowledge and experience can be obtained outside the workplace.

The reverse situation was more common, with knowledge developed from use of computers at work transferred to non-work settings. However this was often a two way traffic. This issue emphasises the way expertise crosses traditional boundaries.

ANOTHER LOCAL EXPERT: ANDY (Group 2)

Although trained in art, and with many years as a working artist, Andy found himself in the role of a computer expert for his family and friends, and with a job as a multimedia expert in an Internet and multimedia development department. He helps his colleagues at work, his friends and artist colleagues and his family with IT issues. Within his workplace he is the 'multimedia' man, he knows how to create animations and multimedia effects. He is not the technology expert and is constantly turning to his colleagues Alec and Noel. Outside his office his knowledge makes him relatively expert. He was instrumental in helping his friend Trevor get into using computers for his work and helps another friend, Trevor's business partner, Nigel too. He discusses IT with his brother in law and was able to help him out by building him a computer. When he did a postgraduate course he experimented with multimedia artworks using computers, and become one of the more experienced people in using these techniques. He is modest about is technical knowledge, but has well developed ideas about the use and application of computers and the Internet, especially for art. His expertise and ideas helped him get a job in an art research department of a University where he entered a work group with similar ideas and vision.

Of course local experts exist for many things. There are experts on cars, on law, education, films, DIY, on professional issues, on health etc. The local expert has developed knowledge and expertise involvement with subject or product, either because of a professional activity, education, an amateur interest, or from a particular experience or event. They are called on by those around them for advice or to lend a hand when they need it. The respondents gave several examples of local experts in other fields, including DIY at home and specialist expertise at work[176]

8.4.1 Local Experts in ICTs

What sets ICT experts apart is the rapid change in the field, which means their expertise has to develop continuously, and its increasing relevance to many people in different areas of life, making that expertise more and more important. The breadth of 'convergence' technologies and services often gives ICT local experts a range of knowledge and interest that goes beyond their particular technology. Some local ICT experts are confident with technology, and are often experimental and early adopters of new ICTs,

relative to the social group(s) for which they are the expert. Maurice (Group 3), Alec (group 2) and Bob (Group 4) have a wide range of interests in electronic and information technology, and know about many innovations they may never see. Alec and Maurice, in particular, not only know about these consumer technologies, but own and use many of them too, from mobile phones and PDAs, to many sorts of computer software application.

However the local expert need not necessarily be such a technological all rounder, or have an in depth knowledge. A local expert can be someone who just happens to be the most knowledgeable, and confident, in one application for example, and not generally confident or competent in others.

The local expert is a *relative* expert compared to those that consult him or her. They are likely to struggle just as much, but just be further down the path of adoption and use. Andy (group 2) helps his brother-in-law:

> I mean I know more than him so I'm the closest contact, … I'm no expert, but I know enough to get over some of the problems that he has but not all obviously... I built his computer. I gave, when I bought my own one I said that I'd sell him my old one.... Andy 1 G2 : 715 – 715

Others, such as Maurice, are professionals, and are much more experienced in their particular area, but are still only advanced amateurs in other technical fields.

Some people like Andy are surprised to become local experts, they never intended to be, and they have to struggle to be the expert! Trevor (group 2) also found himself the local expert for the art community in Inverness and further afield rather unexpectedly. He had adopted the computer and Internet technology as it became available at a cost accessible to his work, and after a few years found himself knowing much more than others around home, and being asked for advice on application of the technology.

Local experts make their expertise available in two ways: they can be reactive or pro-active. Reactively, they provide advice or knowledge if they are asked, either as a professional or amateur. Pro-actively, some promote use or knowledge of a technology – such as making a Web page for someone, lending or selling equipment ec. They can act as an *opinion leader*

in the subject – people turn to them for expert informed opinion that informs the opinions of those around them. However they may not be an opinion leader about general use or attitude to IT, they provide a point of view, but not necessarily a convincing or dominant one.

8.5 What do Local Experts do, and Why do People Turn to Them?

The respondents provided examples of the main activities and uses of local experts:

- To inform and demonstrate to others in their networks
- To provide ICT services and take on responsibility
- To support the adoption process
- To support the learning process
- To solve problems
- Inform and demonstrate innovations to others in the network

It takes a considerable time for innovations to 'diffuse' into a community. This research showed that most of the people interviewed had little idea of the sorts of products and application that were being developed and discussed in industry and among professionals. Through casual conversations, or enthusiastic demonstrations, local experts let their network know about innovations and their applications. For example, it could be related to a specific enquiry 'What is the Internet all about then?' as the questioner wants to find out more about something they heard in the media or saw, or it could come up in conversation about another subject. Even just the knowledge that someone uses a technology is an important demonstration that it is relevant to someone very close. In our examples, Fiona (group 1) found out about the Internet and Web Publishing from her brother in law and from the man putting together her brochure, both local experts. Trevor in group 2 found about the new uses of computers from his friend Andy as they discussed their art work and shared each others experiences.

8.5.1 Providing ICT Services, and taking on Responsibility in a Group

Earlier chapters showed that responsibility for adoption and using ICTs can be passed to others in a network, or those within the network with expertise and access to equipment can be called upon to provide service as a way of using the system, but avoiding personal adoption (this is also a way of trialling technology and finding out how relevant it is). These include using the word processor (Maurice, group 3, Terry and Mary, group 3)[177], sending e-mails (Amanda's flatmate, group 1, and Maurice, group 3), building a computer (Andy, Group 1), and building a web page (Trevor's brother in law).

The Local Expert can take on the responsibility in a group for knowing all the functions of a product, Fiona (group 1) takes advantage this:

> NO, I just use it [the computer] for what I need it for. I don't wonder about its workings, or anything else. if I need something, if I am not sure about something, I will ask Ian or one of the girls, and they will keep me right.
>
> Is your husband more into knowing?
>
> He is pretty good on them. So I just forget promptly. [Fiona1 G1 : 355 - 365]

Since they have the expert present they do not need to put in the effort to learn, or take time to use the technology.

The local expert can be a source of equipment to those in their network. One way is through the process of upgrading, or buying the latest product, and being able to pass on the old version to someone else, as we saw in the section on obtaining equipment. The local expert may be linked into a network of others with spare equipment, and be able to help transfer it to those he knows would like it. Software is of course another product that can be easily passed around a network, including games (Trevor, Andy) and pirated software from work or college (Anon!).

8.5.2 Support for the Adoption Process

One of the main roles of the local expert is to support different aspects of the adoption process including search, decision making, purchase and set-up. When a technology becomes relevant to someone and they need to consider adopting it, they turn to the local expert as a source of advice and knowledge. Not only is there a complex choice involved, but often a risk of

misspending a considerable sum of money, by buying a poor quality or unsuitable product or service, the wrong standard etc. The local expert can reassure the potential adopter that they have made a good decision.

> Well I chatted to Alex, but I had more or less made up my mind, [Andy 1 G2 : 383 - 383]
>
> Ran out of money, and because I felt confident, Alec gave me a hand to plug in the pieces, I felt that I could do that, before I couldn't, I didn't feel confident enough to buy the pieces, it would have to be the full pack from Dell, so that was part of the decision was made for me, part of it was that I could get it cheap enough to do it that way, and I had the confidence in myself and Alex... [Andy 1 G2 : 363 - 363]

Advice can also be on where to buy, how to buy and from whom:

> More or less along the lines of don't buy anything that's not already loaded, and don't buy anything from Dalry Road. [John 1 Gr3 : 179 - 179]
>
> It was the printer that went U.S. and Maurice was very helpful in advising to get a new second-hand computer which this one is. I don't think we got one from Maurice but my husband did get advice from him. ... [Dorothy 1 G3 : 600 - 600]

Trevor (group 2) father-in-law had experience setting up a technology business, and was able to advise Trevor not only on technology, but on financial support:

> Liz's dad who works with optical technologies, cameras and stuff, and he's helped me check out some equipment. He's said there are grants and things available. If you can be persuasive. [TREVOR 2 G2 : 24 - 24]

This is relatively local expertise, based on experience and local knowledge about the market. The advice is not only on technical issues, product or supplier features, reliability etc, but on what is relevant to the needs of the adopter, something that a local expert is likely to be better informed on, and more honest than a salesperson.

> The only place you can go for advice is Mac people who are few and far between and you don't ask suppliers of Macs what's the best thing to do because they just want to sell it to you. Trevor group 2 interview 2

The local experts thus acts as expert on expertise as well as on products and service. They know where to go to find out, and act as a bridge between professional experts and expert sources, mediating and interpreting.

8.5.3 Support the Learning Process.

The complexity and problems of appropriation, especially learning the basic skills, and then integrating the technology into activities are one of the more troublesome aspects of ICTs. The local experts are on hand to support this.

The convenience of being able to ring up a friend or ask a colleague when a problem arises is very important, and saves time and money searching through books, the Internet or struggling with the device. The local expert can also complement formal learning, in college or at school: especially when a quick answer is needed, or a slower, simpler explanation made. Many new ICTs have advanced and extended functions that a user may only come across or feel the need to use only when they gave been using the product or service for some time. The computer is the extreme example, where every new software package installed or updated needs to be learned, so it is very convenient to have someone to call for reminders or practical solutions.

8.5.4 Solving Problems

Many ICTs continually present problems over their lifetime in use. Some, like a computer operating system, can go wrong, or are such sophisticated programs that it appears to be a never ending learning process. Constant upgrades are also a problem, with functions changing and incompatibilities arising. Installing new software and hardware, and learning to use it also creates problems. Connection to the Internet brings its own set of problems. Use problems are not only restricted to computers. Difficulties can arise programming the VCR, trying to find a way through the latest video game, changing settings on the mobile phone and many more. The local expert can be on hand to sort out these things:

> When I'm screaming laugh. When the hair's getting torn out. I don't know, just despair. Well it depends, I mean if it's a problem that, usually the problems I'll think well I'm sure Alex will know, or Noel'll know, 'cos they're pretty, you know, or they'll know where to direct me. But if it's something at home I'll, it'll be a couple of weeks before, you know, trying things out before I sort of ask Alex, please can you come down, this is driving me nuts. Yeah, when it's driving me nuts stage, if that's an answer laugh. ... [Andy 1 G2 : 655 - 655]

Even if they do not know themselves, the expert will have more experience in dealing with problems, be more confident in finding a solution, or knowing where to find out (Hirschman, 1980).

8.6 What are the Advantages of Local Experts over 'Formal' Experts

The services that local experts provide can all be obtained elsewhere: information and opinion can come from the media, and salespeople; learning can be done independently, or on a course, problems can be sorted out by professionals, and services can be paid for. Obviously there are economic reasons for not going to a professional, especially in the first instance. Courses and formal learning may not be convenient, or relevant, and once they are over the support is gone. Using the media, learning about innovations, how to deal with specific problems from newspapers, magazines, the TV and radio and the Internet takes time, and a great deal of filtering out of irrelevant information, if one is looking for a specific answer. In the media, even the most general types of article and programmes can still be too complicated for the novice, and there is no opportunity to question, or ask for explanation. In summary there are economic benefits, advantages in the type of personalised local knowledge they provide, and in the flexible, convenient and trusted relationship with the expert.

8.6.1 The Knowledge of Local Experts

From the point of view of the knowledge that experts have (which I will come back to later in this chapter), local experts have two advantages. First, they have local, practical knowledge of a particular product, system or content, the use it is put to, and also the knowledge and concerns of those who are trying to adopt or use it. This knowledge can be more relevant than general, technical knowledge: they know how to explain it, and explain as part of an on-going relationship of advice, rather than a on-off or impersonal contact. Formal experts may never obtain this level of situational knowledge. Second, formal experts may be inaccessible, due to remoteness, cost, apparent abstractness of their technical knowledge, their commercial or organisation agenda etc. Local experts can be easier to understand, more approachable (less fear of sounding ignorant) and more likely to spend the time to understand the problem and explain it in understandable terms. This research demonstrates how these advantages are created and used.

8.6.2 The Everyday Expert

It is tempting to look for specific events and instances of word-of-mouth influence and information seeking in the adoption process, or as part of the interactions of experts and their network. While these events are important, the everyday interactions of local experts with those around them are also very important: the integration of talk about new ICTs into every encounter, passing references in conversations, or using the topic of ICTs as a main point of conversation in more or less obligatory relationships such as family. Enthusiasm for the ICTs shared between friends, colleagues and family members means there is always a topic of conversation to pass the time with, and when the expert is present, then it is a good chance the topic will come up.

The local experts and those they helped had close, familiar relationships. Those in the same family or office saw each other every day. Other friends or family would ring each other often, and visit frequently. There is plenty of opportunity to ask advice, or for the conversation to turn to ICTs in these regular contacts. One example is Amanda asking her uncle about something she had seen on the TV during a visit:

> Well on the news and when it was launched about a month ago. And every now and again there's another company - I think it was Sky Digital and then BBC, it was the BBC mainly because they kind of BBC Digital first. They were advertising quite a lot. And I didn't understand at all what it was at first. I asked my uncle about it actually because I was interested because they were talking about clearer pictures and all this sort of thing. I didn't realise you had to buy a completely new tube set and everything but they're saying that once say that telly blew up we wouldn't even consider buying another one like that. You'd buy one that's got the gadgets. [Amanda2 G1 : 222 - 222]

Another everyday situation where discussion of ICTs occurs is between parents and children about what they did at school, such as between Fiona and her children Laura and Lisa. Laura and Lisa both have the use of computers on the curriculum, and are relatively skilled and engaged, and feedback some of their experiences and thoughts to their mother.

Other Local Experts are always engaging in conversations that include ICTs when they meet with those in their network who are using ICTs. Andy (group 2) has conversations with his brother in law, Alec (group 2) with his father,

Trevor and Andy (group 2) talk together, Amanda (group 1) brings ICTs up with her uncle, Maurice (group 3) and his father in law, John, and John with his brother-in-law. Terry and Mary know that since Maurice is an ICT expert, conversations with him and his wife will often cover technology, even though their, especially her, enthusiasm for ICT developments is limited.

> JKS: Do you ever talk to, come up in conversation with Ruth, computers or IT or anything. She's just got a mobile phone I think.
>
> Mary: I think she mentioned it and I was very surprised because she didn't say "oh I've got a mobile phone." It was mentioned in the conversation, just you know, glancing past it. She talks about the fact that Maurice is the one that's much quicker than her so he does things for her.
>
> Terry: Well he will be because we're going round to see them on Saturday and I'll be very interested to find out from Maurice how his business is doing so inevitably talk will be centred roundabout IT and what people's views are about it because it's very crucial to Maurice's business. I would imagine that I'm a potential customer so he, for his own interest he would certainly want to know what our views are about it and until we're linked up onto the Internet he's not going to get any business out of us or any people like us.

Local experts are available very easily

While people in corporations may have access to computer support departments, with instant advice, home users, and those outside organisations have to make do with other methods. One way is to be self-reliant - in other words, use books, on-line help, the Internet, other information sources. Another way is to pay a commercial service to help. The third way is to make use of the local expert. In these two examples John and Nigel both use their local expert to provide instant advice and help.

> I get on well enough with Maurice, chiefly because I see very little of him. He is so engrossed with him computery business, or preparing for going away to coach some folk, that I really have to pin him down and say, "Look, I want to know" and he'll tell me. I had problems with the computer a couple of months back and I phoned him up. He said "No, there's no way I can explain over the phone, I'll come down". Which he did do, when it was convenient, not instantly, I didn't want him to do that. But he came down and fixed it. Yes, we get on. But we've never ever had any paratactic time together, it's not like you sometimes see where father in law and some in law go down to the pub and leave the women to it, we're not in that business at all. [John 1 Gr3 : 103 - 103]

> No it's pretty straightforward enough. I mean I was having a bit of a problem with the printer picking up messages, so I just telephoned to Andy and he sorted me out in like five minutes. If I need, if I got into any problems I'd just phone him up basically. [Nigel2 G2 : 93 - 93]

Because of the informal, close relationship, it is easy to call up, or visit when a particular problem arises, as well as bring it up in conversation as part of other visits or calls.

Trust and the understanding expert

The local expert can deal with the problems and issues at the level of the person they are helping, which often demands considerable patience, something a professional may not have, or be able to give the time to.

> Well they showed me in the shop how to do it, and maybe one... Mharie's husband showed me how to do something. And it sticks in my mind better when I am shown, and I am not keen on reading how to do something. But ... otherwise, I don't know I find a lot of these things, written, printed into English from Chinese, they are not always very well explained, that's right.., they are a bit dicey, but otherwise. [Helen Stewart 1 G1 : 321 - 321]

Local experts are non-threatening. A key factor is the trusted nature of the relationship with the expert. Local experts can be approach informally, and are trusted enough to help with even the most basic problems. There is a low risk element in asking for advice – it is free, and unlikely to be biased by a desire to sell or promote particular product.

8.6.3 The Trouble with Experts

Local, informal experts are not necessarily any better at being expert than 'formal' experts, and suffer from all the same problems. However their personality is not mediated by professional behaviour. There can be all sorts of things wrong with the advice and help they give, and the way they give it, or withhold it…! Having set out some of the perceived advantages of local experts it is important to recognise their limits too. Some local experts are known for only talking in jargon, of operating way above the level of the people who go to them for advice. It does not take much of difference in knowledge for this to happen, as John (group 3) finds with his brother in law:

> Oh yes, very much so. He's [his brother in Law] an amateur, but he knows a great deal, he's got great pals in Eastbourne. He has a friend who makes a living by operating various financial statistical services for a chosen few clients. Eddie gets a down-load from him and any problems he just phones him up. I try and do the same thing with Eddie, but the snag is that I am so delayed, retarded and he's so advanced, that half the time he can't understand what the hell I'm talking about. However, he does a percentage of time say, you don't do that, you do this. [John 2 G3 : 46 - 46]

While talking ‘over-ones head’ may not be too much of a problem, it could create barriers, give the impression of over-complicatedness, to delay the adoption of a technology. Their expertise can make others feel somehow inept. Sometimes having a local expert in a network can be a positive resource for the others, in other cases they may actually make the technology appear less relevant, more complicated, more boring or ‘ for nerds’ than may have otherwise been the case.

In the networks I studied, the local experts were useful for some of their group, but for others they were no help, and the fact that the conversation would turn to computers or other ICTs every time they were around was a bore. Since these people, such as Fiona (group1), Amanda (group 1), Dorothy (group 3), Nigel (group 2) had a considerable determination not to be interested, then there was little the expert could do to make them interested. Only when the innovations started to be interesting, which occurred for Fiona and Amanda by the second interview did the knowledge of the expert start to be more interesting and worth listening to.

Local experts do not necessarily have good advice or really know very much. In this research I did not come across this as being a problem, most people were thankful for any sort of advice, but it is possible that misleading advice from a local expert without much technical knowledge could be a problem in some cases. One thing the local expert can do is point the way to someone with much more experience.

Another problem with calling on local expertise is the strain it can put on a relationship. Nigel and Trevor (group 2) are an example. Nigel relied on Trevor to use the computer, to enter and layout text that he had written, which eventually became too much for Trevor. Even Nigel felt bad about this himself, and it seems as if he preferred to ring another friend Andy for help after he got his own machine, rather than impose on Trevor too much:

> (Well if it's to do with the company mostly I talk to Trevor. If it's to do with the computer I might talk to Andy. But I usually solve, in terms of my own work I usually solve it myself. I guess I might talk, I might just be talking to somebody about what I'm doing and it could be anybody if they're interested I'll just talk and if I'm worrying, wondering about this and

> really maybe all I'm doing is just thinking aloud to a sound box so I might get some waves back, I might not. Eh, so, you know, I mean I don't - basically sometimes if I need help in moving things I might ask X Y or Z, whoever can be available to give us a hand. But I'm not into a kind of pattern of reliance on other people helping out. And I don't like to think that I'm getting myself into that state where every second day I'm on the phone worrying somebody about a problem. I do like to solve them myself and only when I'm really pushed will I ask for assistance.) [Nigel 1 G2 : 125 - 125]

In short, local experts are not the perfect resource for the adoption and use of ICT, and we should not overestimate their importance in smoothing the appropriation of ICTs.

8.7 What do they Know, and How do they Know it

In the previous section I suggested that the type of knowledge that local experts have was broader than more detached formal experts. The research gave some insights into these types of knowledge, and their importance. In summary:

Knowledge related to the technology and industry:

1. They have technical expertise or know how.
2. They know how to apply technology to specific activities.
3. They know about products and services .
4. They have knowledge about the market, standards and new innovations.
5. Know who and where to go for purchase, advice, learning locally.

Knowledge related to themselves and those they help:

1. They know about the learning process.
2. They know about the people they are advising, or talking to.
3. They know the experience of those they are helping.
4. They know from personal experience (They have ‘been there’).
5. They know the problems of adopting and using.
6. Experts are more confident with technologies – less intimidated, prepared to ‘have a go’, know that there is a solution.

Expertise can come though working with the technology as a developer, being an engineer or technician. However as the technology moves towards standardisation, and becomes a tool that anyone can apply, it is the experience in using to do an activity that is crucial. E.g. Trevor (group 2) who uses the computer and e-mail and other technology to develop his art

businesses becomes first a local expert for his friends on everyday dealing with the technology, then a local expert for the artistic community on its use as a tool for developing an international business. His innovation and his experimentation is not the technology or technology system, but the business that could not exist without it. Nonetheless, he is still called on to provide expertise in the most basic user skills, and the most banal ideas for applying the technology.

Local experts provide a bridge between the industry and the local context. They convert their knowledge obtained through the media, through broader contacts in the field, possibly through the Internet, and through personal experience to relevant knowledge for their local network. Because they are a local expert in a network, they may be approached by many different people with similar problems, and are thus develop knowledge of what is relevant for non-experts.

Local Expert Example 3

Trevor became an expert as necessity and with help from his friends. Andy showed him what could be done using personal computers, desk top publishing and the Internet, to develop his business and art, and slowly he developed expertise in using them. He had computer training when was much younger, and was very comfortable in adopting the technology, and there were considerable benefits for his work to use it. He is generally entrepreneurial, and is very happy to experiment and try new things including technologies. He was able to put together exhibitions from the north of Scotland that impressed other artists, and the local public arts bodies, even if they were initially reluctant, and had trouble understanding their significance and use. Trevor has become recognised as an expert in application and understanding of Internet and PC technology which he passes on to others, including his wife and his business partner Nigel. He has advised and helped others in his profession to think about and use the technology. He was surprised to find himself an expert.

8.7.1 How do they Know what they Know : Struggle for Knowledge

How do local experts get their knowledge? This is the same question as asking how anyone learns: they have formal training, they use the media, they talk to others in a network of experts, or they consult their own expert, and finally and most importantly they learn by doing, and by innovating the

application of the technology to their activities. However by looking at some of the ways they learn, it reveals the effort and expense they go to, and why others many not be able to or be interested in doing this, preferring to rely on those who do.

One activity is information searching and browsing, as the examples of Trevor and Andy (group 2) show:

> I get computer magazines every week. I get What Personal Computer, not sorry, Personal Computer World every month and I quite often buy PC Pro. I get that maybe on average every second month. But I get PC World every month. I've only missed one or two issues in the last few years so that keeps me in touch with what's on the market and the prices and then you look, 'cos they're the cheapest in town, I just look at the rack there and see what they've got and how much it all costs. how big a hard disk I could afford. I'd really like to have got a 9meg, 9 gigabyte hard disk but couldn't really, could only afford a 3.2 and 32 meg of ram so it's very adequate for the work I'm doing. [Andy 1 G2 : 371 - 371]

> I keep an eye out and it's THE Mac magazines, for keeping an eye on prices ... you've got to keep up with what's going on. Trevor group 2 interview 2

The local expert themselves has often developed a network of those with similar interests and expertise, and will consult their own local expert in turn. Alec is the technical expert for a number of people in his office and family, and has a circle of contacts with whom he shares his interests on a professional and personal level.

> Yes, I've got quite a good circle of friends and contacts, all from different areas of technology. Again, measuring up trends, what we think of new technologies coming along. It is a kind of technology watch. The technology affects different people in different ways, the way they work or are developed. [ALEC 2 G2 : 129 - 129]

Trevor is a local expert for a number of people, but he will consult his wife's family and his friend Andy about problems and issues. Andy in turn will go to Alec for advice.

> But I also talk to Liz's father is an engineer, a technician, he builds - although he's an engineer and he does a lot of digital work in cameras and underground systems and such like so and her brother is a computer programmer so I get a lot of advice from them. And they're PC based. And talking to Andy who's PC and talking to - much of the Mac stuff you just have to be very, very self motivated and keep going at it because the only place you can go for advice is Mac people who are few and far between and you don't ask suppliers of Macs what's the best thing to do because they just want to sell it to you. So you have to learn ... yourself. Trevor group 2 interview 2

Trevor was introduced to using IT for art and his business by Andy, but over time he has made contact with others with whom he can share experiences and knowledge. For support on using the Apple Mac he uses an on-line

group of users in the North of Scotland, many of whom are American engineers working in the local nuclear station.

Interacting with other experienced users is important to keeping on top of the technology, which otherwise can be quite a lonely occupation. Information is difficult to come by, takes time and expense to find, and it is necessary to 'fight' the commercial system to assess the knowledge. The self reliance and dedication of the local expert with regard to learning about ICTs is a notable feature. Bob (group 4), Andy and Trevor all showed this. The difficulty of adopting some ICTs demands a dedication and a motivation that is probably off-putting to many people, unless they have a local expert available.

Maurice's (group 3) example is an example of the local expert learning by struggling and mistakes. He made mistakes with his Internet provider, has trouble with his mobile phone company, buys the wrong expansion card for his PC and so on. These bad experiences in the market taught him things he was able to pass on to others who asked advice about suppliers. Learning by doing is thus a key feature in the development of their expertise.

8.8 What is it like to be a Local Expert

The local expert invests a considerable amount of time and effort in appropriating ICTs, and keeping in touch with developments. They also have to carry out their role as local expert for those around them. There are a number questions to raise about what it is like to be a local expert, and if we can identify any particular characteristics in their relationships, use of ICTs, personality and the way they manage their life and use of ICTs. What is it like to be the local expert in ICTs? Are they more likely to be both home and work users of ICTs? Are they more likely to be innovative in general? Do they acknowledge their role as an expert, and how does it influence their relationships?

This research can throw some light on this, but there are also many gaps that future research could investigate.

8.8.1 Expertise and the Boundaries of Everyday Life

One aspect of local experts is the cross-over between their work, home and other parts of their lives. The experts in this study are some of the most engaged with ICTs of their networks, often working with these tools professionally. Their use of ICTs and their learning and expert role crosses boundaries between home, employment, social circle, and family relations. They are experts precisely because they do not respect or enforce boundaries on technology. Trevor mentioned in the previous section, how he discussed computers he uses for work with other 'experts' in his family, with his friend Andy:

> I also talk to Liz's father is an engineer, a technician, he builds - although he's an engineer and he does a lot of digital work in cameras and underground systems and such like so and her brother is a computer programmer so I get a lot of advice from them. And they're PC based. And talking to Andy who's PC Trevor group 2 interview 2

Andy and Alec, both single men in their 40s, have little boundary between their home and work use of ICTs, and both provide their expertise to colleagues and family alike.

The weak boundaries between home and work, friends and colleagues make it easier for them to be local experts, since they can spend their own time working with the technology, building up expertise what they can apply at work, but it is not a one way effect. The cross over of similar technology between home and work allows this too, such as the woman in Ruth's office who learned to use the computer at home, and transferred the skills to work. Those who draw lines between what is defined as a work technology and a home technology, limit the type of expertise they can develop, and their willingness to discussing or engage with others on issues of the technology outside the domain the reserve it for. However it is equally likely that many people who have experience and knowledge of ICTs at work may put up strong boundaries to keep these activities out of their home life.

8.8.2 Becoming a Local Expert

The local experts all acknowledge that they played this role. However none of them set out to be experts; they found that their expertise became

valuable to those around them after they had developed it for their own activities. In general, this expertise was fairly irrelevant to most of their circle until recently. Andy summarises the way that his expertise has become more relevant to the general population, and suddenly everyone seems to want some advice:

> I think people are much more aware of it now than they were even a year ago probably, with the BBC being more Internet, they always have a follow up maybe a television program with some Internet stuff. Your average person is far more aware of the Internet now than 2 or 3 years ago. I think people are getting more and more aware, just in taxis if somebody asks me what I do and I say web design, two or three times, the taxi drivers ask about it and say "I've been thinking about getting a computer and on to the Internet". You wouldn't have expected that a year or two ago, for them to react in that way. Also with education, with the government pushing the National Learning Grid, that has heightened the awareness a lot. [Andy 2 G2 : 106 - 106]

Becoming an expert was a surprise for some people, especially when they did not see their own expertise and enthusiasm as anything particular. Trevor was surprised to find that many in the arts community suddenly started seeing him as some sort of IT guru. Others (e.g. Bob, Group 4) were rather reluctant to take on the role, as they started to find themselves categorised as the IT expert, and it was also a demand on their time and goodwill.

> my ex wife is wanting me to work on some multi-media stuff with her and they're talking about £5,000 for doing that…I'm encouraging her to do it herself, but she wants me to get involved. If the money is coming them I will. I don't care what anybody thinks now, I've done my bit of helping people for nothing. If someone asks me to do something I ask what money is involved in it.

This reluctance was found to be very strong by 2001, in a study of computer professionals many of whom claimed that the last thing they wanted to do was to go home after work and help someone fix their computer. This is also evidence that today many IT professionals are not necessarily computer enthusiasts, and the pressure of their work means they want to keep computers out of their non-work time[178].

What these responses to being an local expert re-emphasise is that it is a *relative* position, often of being less ignorant than the others around in a community where even a little knowledge is more than most people have. It also shows that the local expert is often not a ‘specialist’ in IT, but just has

basic knowledge, and knows how the *technology is relevant to the activities and individuals within their community.*

This relative isolation within a community with no ICT culture means that the local experts have had to find their own way, either learning themselves in isolation, to reaching out to other parts of their social network, and bringing in the knowledge from other communities. This brings back the idea of cross-overs between everyday domains. It also means that the would be expert may have to reach further than their close social network, making new connections with other experts, informally or formally, such as by enrolling in a class, as has been discussed earlier.

8.9 A Brief Critical Reflection on Local ICT Experts

8.9.1 Gender, Age and other Socio-Demographic Factors

Studies of populations generally try to find patterns of activities and roles that relate to socio-demographic factors such as age, gender, family status, education, and income, or to previously constructed 'lifestyle' categories. Can we learn anything about local experts from this approach, and from the cases in this study?

First, methodologically it would be impossible to make generalisations about these factors from such a small sample. However it is still worth reflecting on who the experts were in this research in these terms. For example, the local experts, such as Andy, Bob, Trevor, Valerie's brother in law, Amanda's uncle, John's brother in law, are all men. This compares with the preponderance of women among those who were sceptical or resistant to new ICTs and technology in general. This imbalance is unlikely to be a feature of local experts, but rather of the predominance of men as computer users, or working in professions where information and communications technologies are more common. However, distinguishing between local experts that offer basic technical advice, and those that are techno-enthusiasts may also be a way of seeing a gender imbalance. Some studies suggests that men are more likely to be enthusiastic about new ICT

innovations and this would be reflected the number of male experts. Two questions arise. First. is this changing as the technology changes and as a younger generation of women grow up with computer, mobile phone, video games and the Internet at home, school, college, at work and as part of the cultural explosion of the Internet? Second, do the male local experts communicate better with other men who are developing an enthusiasm for new ICTs, rather than with women?

8.9.2 What sort of social connections do local experts have ?

Work on opinion brokers and on weak ties in social networks suggests that certain people are connected in many networks, and are able to transfer information and knowledge between networks, and have access to many different attitudes, information sources, cultures. Consumer studies might call this type of individual ‘cosmopolitan’, a predictor of early adoption. Did the local experts have this sort of network? In general many of the respondents had a number of different social groups in which they participated: family, friends, work colleagues, sports clubs etc. How important is the cross over between these groups? Participating in a small number of work/family/friends communities is not the same as having a social network that links to a number of different communities.

Local experts in ICTs at this time could also be identified as individualists, who made the motivation to adopt and use ahead of many of those around them. Again this can be identified in some cases, but it depends which social network one looks at – maybe within their family or social circle they are entrepreneurial, or early adopters, but compared with their colleagues they are not. Equally the other way around, someone working in a relatively technology-resistant organisation may come from a family or circle of friends where adopting and using innovations and new ICTs is not unusual.

8.9.3 Influence in the Social Network

In the review of social networks and adoption, two structural factors influencing the adoption of innovations were discussed: *cohesion*, where the

immediate social network is a determining factor in adoption, and *equivalence*, where adoption can be predicted by comparison with others who share similar activities, resources, demographics, profession etc. (Burt, 1999). So far, this study, seems to go some way to concurring with ideas of adoption in line with equivalence rather then cohesion, concepts introduced earlier. For example, just because a woman's husband uses computers does not mean she will adopt, but when she sees other 'equivalents' with similar values, income, age, status etc adopting, she is more likely to adopt herself. However in this circumstance we will use cohesive (close) relationships as a sources of knowledge – especially those members of a network who have strong links to knowledge and examples outside the immediate network i.e. local experts. The local expert would appear to play a role in bridging networks, bringing examples of equivalent adoption from one part of their network to another e.g. from work to home.

8.9.4 Conclusions

In conclusion, Local Experts have a key role in their local communities and in the local economy. They provide trusted, if not always reliable, help for others making their steps in forming attitudes to innovations and adopting them. They also provide on going support. Their expertise is local and relative, they have often become the local experts to their own surprise. They often bring their expertise across the boundaries of in their life sphere where they have had the opportunity to develop it. They are also often innovators, having to find their own way with new technology, using external sources of knowledge and expertise. This could be because they were obliged to, or out of some sort of natural curiosity. Within a social network they are only one of a number of important individuals in the domestication process, with others playing the roles of enthusiast, sceptic, primary adopter and financier[179]. They are not necessarily an opinion leader or the source of influence on underlying values, but they are a key role in helping others through the ups and downs of their own appropriation.

Chapter 9 Non-use and non-adoption

9.1 Introduction

So far we have been looking at how people encounter ICTs, and some of the adoption and appropriation processes and strategies that can be seen. However an important principal of STS is to treat success and failure symmetrically, so I will address non-adoption and non-use with the same attention as adoption. This point was made in the review of the literature on adoption and diffusion of innovation as a major weakness in existing work. In particular, the diffusion of innovations literature has typically started with a particular artefact and traced the adoption process, seeking to explain though psychological or demographic factors why some classes of people have been earlier to adopt than others. The research design was structured precisely to facilitate an investigation taking as a starting point people in context, rather than the adoption of specific artefacts. This chapter looks at the non-adoption and non-use aspects of the empirical study. We can start to see why certain respondent did not adopt ICTs, locating their attitudes and behaviour in the context of their everyday life. This covers their specific criticisms of individual technologies, more general positions of resistance to innovations, including the reasons why people do not adopted, from financial constraints to fear of machines. It becomes clear that a simple model of rejection does not apply in many cases where there are multiple interrelated technologies being across the life sphere, sometimes by choice, sometimes by obligation.

Following investigation of the empirical material through the BEAN framework in this chapter the following chapter draws conclusions in terms of an extended version of the common model of 'barriers' to adoption[180], strategies and tactics employed in non-adoption, and what it is like to be a non-adopter[181].

In the title of the chapter I used the terms non-adoption and non-use. The two terms can sometimes be used interchangeably, but are slightly different. Non-adoption is opposed to adoption, when someone will not or cannot go through the process of adopting a product or service. In particular, it is a term used when discussing the introduction of new products. Non-use covers the area of the individual being a non-user of a particular product, their identity as a non-user, their activities being carried out without a particular technology, and without the ongoing practical engagement with a technology. Although it might be possible to discuss these separately, they are closely linked in several ways. For example, expectations about what is involved in being a user put people off adoption, and non-use of one technology strongly influences attitudes to and adoption of other technologies.

The difficulties of drawing boundaries around which technologies should be investigated, and which left out, have already been noted in the chapter on methodology. There are many thousands of ICTs and specific applications, almost all of which the majority of the population will not use, and probably have never even heard of. If one is studying non-adoption and non-use, how can one decide which technologies to look at? One way is to let the respondents indicate which technologies they do not use. This study threw the net of interest quite wide, trying to pick up on the use and knowledge of the full range of technologies the respondents were engaging with, as they brought them up, whether they be electronic bread makers or automated blood testing machines. This ‘bottom up’ approach was complemented with more targeted questioning regarding particular technologies that are either common or industry is heavily promoting. The respondents were asked about their use of the main established ICTs, principally television, telephone and the PC, and developing technologies and services including the Internet, digital television, interactive television, mobile phones, and video games. This included specific applications and content on these platforms, such as e-mail, home shopping, business management tools, tele-banking, on-line news and entertainment, and computer-based education. They were also

asked about their knowledge of a wider range of ICT innovations. In terms of non-use or limited use, all the respondents spoke about television and the telephone, technologies they had direct contact with, and of which they had a developed a sophisticated understanding, being generally integrated into their lives even if they did not actually use them. The mobile phone and the PC were familiar technologies, but there were a range of different experiences and interpretations of these technologies, and much more non-adoption and non use. More specific technologies, from e-mail to digital television were more often than not unknown, or little understood. Nonetheless addressing these technologies brought out a discussion of a range of non-adoption processes and strategies.

The examples in this chapter group together reactions to many different technologies that have a huge range of attributes and affordances. Most studies in the field focus on a particular technology and compare different responses to it, or systematically analyse its specific attributes, functionality, marketing and supply, and the needs, resources, attitudes and requirements of users and potential users. This was not the approach of this study, which looks for common strategies and processes across technologies, as they are encountered in a natural context. Often people have similar reactions to a number of different technologies, facing similar problems from apparently different technologies, and associating them with particular issues, such as personal control, incompetence, rapid change, youth, etc. Also, with increased convergence of technologies (devices and networks), it is important to compare interpretations of technologies that sooner or later may share the same functionality and uses.

9.2 Non-adoption and Non-use in the Case Studies,

9.2.1 A first look at the data

The cases showed that there were many reasons why people had not adopted particular technologies. Working from the data, I built up a list of reasons people gave for not adopting technologies, both in general and in

reference to range of particular products. These included established ICTs as well as new products and services, some not even on the market, to provide a broad base of examples that could be used to build a comprehensive picture of non-adoption behaviour and attitudes. In analysing the data I first sought to mark relevant interview extracts identifying them under a wide range of relatively specific headings. This list need to be further distilled for useful analysis. I therefore grouped closely related headings into a set of categories for explanations of non-use. The tables below give a summary of these reasons under common categories, and a list of the headings and phrases that I drew directly from the interviews in Group 1 only. Each table groups together similar types of statements given for non adopting or using, such as those indicating perceived lack of relevance or need for an innovation. The columns give more specific examples of the comments that led me to create these categories, with a specific illustrative quote. Looking across all four study groups these types of response were common and more examples will be brought in the rest of the chapter. Many of the categories seem similar, such as ‘not interested’, and ‘not relevant’, and in following discussion I attempt to see if they are different, or just expressions of the same phenomena. Also, at this level of data investigation, it is difficult to start grouping the categories according to a more abstract theoretical framework. However, later, the comments grouped here under, for example, ‘not interested’ will be found to relate to issues of professional activities, boundary making organisation of time and space, self-identity and background, and the social consumption space.

The first main group of reasons for not adopting were *lack of interest* in particular innovations, or in ICTs in general (Table 17). In these instances, either the respondents had not heard of the particular innovations, avoided finding out about them in general, or had no interest in following up and adopting a known innovation.

A second group of reasons were related but involved a more emphatic *refusal* of the technology, based on some sort of assessment that it was

irrelevant, not good enough or that there were better alternatives (Table 18). Sometimes this was because the respondent assumed that an innovation would be *irrelevant,* without even trying it, or because a trial or investigation of the technology had shown that it was not right for them. One of the reasons why a technology was judged as irrelevant was because the respondent *disliked* some aspect of it (Table 19), including not liking to use it, or they did not like the idea of the service and the supplier.

One of the main reasons why people disliked ICT innovations is that they did not like *change* (Table 20), principally because they do not want to, or feel they are not equipped with the skills and knowledge it would require to deal with that change. In particular, some of the older people saw their age as an important factor that meant they did not have to put in the effort to make a change.

Lack of interest or motivation		
Provisional Category for non-adoption/use explanation	**Headings generated from first analysis of interviews of group 1**	**Examples of comments included in this category by Group 1**
Too much bother/not got round to it	don't bother - *Mike* Never bothered - *Amanda* didn't get round to/ put off - *Valerie* putting it off -*Fiona* putting off - *Mike* interested, but not to own or use - *Helen* If it was convenient / owned by someone else - *Amanda* Would like a gift, if not buy it - *Valerie* - expectation of technical redundancy- *Fiona*	(CableTV) "I don't know which, if it's worth getting Telewest in if it's going to be overtaken by something else so we weren't really that bothered" *Amanda* 1 "I haven't even, that's the other thing, the bank keeps sending me details about their 24 hour banking and phoning up and I've never bothered, and I should." *Amanda* 1 (Computer)"But I wouldn't have one myself. I think we're at the age group that we just don't have - we've had enough. " *Helen* 1
Avoid or ignore information	ignore shops *Helen* ignored information - *Amanda* ignore information - *Mike*	(use of ICTs in industry) Again it's probably, I've heard it but I haven't taken it in. *Amanda* 1 (Computer prices) I've seen figures and you see the newspapers and lists of computers, I haven't taken any notice. *Mike* 1

Table 17 Non adoption in Group 1: Lack of interest or motivation

There were also many problems and restrictions to adoption and use apart from knowledge and attitudes (Table 21). In particular, the *cost* of many new ICTs was seen as prohibitive, or at least the relative cost. Other restrictions included lack of access to network infrastructure, lack of time and space in a busy life, and restrictions imposed by family and work organisation. Finally, some people benefited from the technology indirectly, even though did not or would not adopt, because they could pass responsibility for using it on to others (Table 22)

Does not satisfy need, or seem relevant		
Not relevant/ No need	Irrelevant- *Helen* not relevant *Amanda*- not relevant use –*Helen* (about *Mike*) not relevant, not useful, not important function - *Mike* no need of service - *Amanda* No use - *Valerie* not convinced of benefits- *Fiona* Waste of time *Valerie*	(Mobile Phone)I don't really feel the need of it at other times. I'd rather just get to a phone somehow. *Valerie* 1 (Internet) I don't think it's [the Internet] really that beneficial, not in a primary school. I could see the uses in a secondary school a lot. I mean I can't imagine having the time to set them on a task on the Internet and you'd have to monitor because you hear all these stories about kids getting into things that they shouldn't be getting into, I don't really see - definitely not down in the infants *Amanda* 1
Put off by experience	didn't like to use - Lisa Put off by experience- *Fiona* Put off by experience - *Helen*	(multichannel TV) "the States and having about 30 channels and finding nothing that was worth watching. You seemed to get more rubbish when there more channels..." *Mike* 1 (Internet Chat) Lisa " You have no idea who you're talking to and where they're from [on Internet Chat] And you're not sure what they're going to ask " *Fiona*: "Was it disconcerting? Or was it interesting?" Lisa: "No it was just strange"
Unsatisfactory	Content unsatisfactory- *Valerie* Content unsatisfactory- *Amanda* Content unsatisfactory - *Fiona* Confusing - *Mike*	I wouldn't, I wouldn't like to go on [multichannel TV], there are far to many. I remember in America, there was thousands, people didn't know which one to watch, and they were all rubbish, I find four [channels enough], only thing is you are going to miss out on some of the sport things,. *Helen* 1
No better than existing service	existing service improved - *Amanda* Existing service satisfactory - *Helen* Other means - *Valerie* other more attractive alternative - *Mike* satisfied with current - *Fiona*	(Web) "I mean I wouldn't go to find a computer to do it. I'd rather find a book on Paris, read it but if I had one yeah I would. " *Amanda* 1

Table 18 Non adoption in Group 1: Does not satisfy need, or seem relevant

Dislike use of (a) technology

Don't approve	Dislike of business behind it-*Mike* Don't approve of use - *Fiona*	(video games) "but I don't really think that it improves anybody's lifestyle sitting glued to a TV playing games" *Fiona* 1 (Satellite TV) "I'm sure if we wanted we could buy a dish in and use it. If you think of different things that we spend our money on I'm sure we could find money to do it but I'm prejudiced against it, that's why I don't want to." *Mike* 1
Don't like to spend time on technology	Waste of time - *Valerie* Don't like it - *Fiona* Don't like it outside work - *Fiona* Don't like too much technology around in life - *Fiona*	(Computer) "but I wouldn't like to spent too much time on it. Again it is something I do not like to spend too much time just sitting.. I have a thing about thins, just sitting at a screen working " *Valerie* 1
Prefer face to face communication	Don't like interaction with technology when you expect a person - *Helen* prefer face to face - *Helen* prefer face to face communication- *Fiona* prefer personal communication- *Fiona* Need face to face communication - *Mike*	(interactive television) "Well on the other hand, think of an elderly person sitting in a chair and he or she sees this on the screen, like ourselves, we see something but so often we don't understand what all the official thing is about. I like something to be explained. We need to ask." *Mike* 1

Table 19 Non adoption in Group 1: Dislike use of (a) technology

Resistance to change and lack of confidence in learning		
Too Old	Too old - *Helen* Too old *Mike*	I think we are too old for using computers, I think it is really a young person, I think you need to be taught at an early age, whereas when you are older, everything is a bit more for you to take it in. *Helen* 1
Don't want to change	Don't want change - *Valerie* Don't want to learn - *Mike* Not wanting to learn - *Valerie*	(Computer) "But I wouldn't have one myself. I think we're at the age group that we just don't have - we've had enough." *Helen* 1
Do not have skills/can't/don't want to learn	lack of experience - *Amanda* skills deficit - *Amanda* skills deficit - *Helen* no access to training - *Amanda* Don't know how to learn - *Mike*	(Computer)"and others [teachers] who were very difficult because it was some new technology, and they didn't want to use it, they felt it wasn't part of their job. " *Valerie* 1
Fear/lack of confidence	Apprehension - *Helen* Fear – *Mike* use problem - Lisa Fear - *Amanda* Lack of confidence - *Valerie* Confusing - *Mike* Need face to face communication - *Helen* older technology too difficult- *Fiona*	(Computer) "so I was quite frightened of them at first. And I wasn't able to make that link. I feel I have to have a pen in my hand to think. " *Amanda* 1 (Video games) "No only the children's computer at Clare's house, doing these funny wee things, and I find I really get worked up, I am not keen on using it"

	too complicated - *Mike* too difficult to use - *Fiona* confusing -*Mike*	*Helen* 1

Table 20 Non adoption in Group 1: Resistance to change and lack of confidence in learning

Restrictions and Problems		
Infrastructure/ technical problems	infrastructure problems - *Valerie* Technical problems - *Amanda* technical problems - *Valerie* technology too old for use - Laura no infrastructure - Lisa	(Telephone charge Card)"I think it's those types of phones that I don't really know what they mean. It's for phoning abroad using the number, a sort of pin number and Richard had tried to do that for my phones and he can't and I wondered why. I must phone BT and find out. " *Amanda* 1
Too expensive	Expense unjustifiable -*Valerie* expensive -*Helen* Too expensive - *Valerie* Too expensive - *Helen* too expensive - *Mike* other priorities - *Valerie* other priorities - *Fiona*	(Computer) "No I did look at one time and thought it was too expensive for me considering I wasn't going to make a lot of use" *Valerie* 1 "but there are other priorities and other things I'd rather spend my money on than a computer." *Valerie* 1
No time or space	No room for it - *Fiona* no chance -Laura no chance - Lisa no time - Lisa Not enough space - *Amanda* Not enough time - *Fiona* not finding time - *Valerie*	(Computer) "Basically I haven't got room. But they all, it's the same class, they all used it a lot last year and I hope we get it in a block next year. But it's such a, it takes up such a big space in my wee room so." *Amanda* 1
Restrictions and limits imposed	restriction imposed - Lisa no access to training - *Amanda* no chance -Laura Don't have it at home - Laura	(Computer training) "I think it came out so they're trying to set up their own information technology in Greenhall which isn't really fully up and running yet so there hasn't been a great deal of courses " *Amanda* 1 (Internet access) "There's some - other people tend to use it more [Internet]. I don't get much of a chance because of the subjects I do." Laura 1

Table 21 Non adoption in Group 1: Restrictions and Problems

Reliance on others		
Rely on someone else	Prefer not to do the task oneself, despite the tool being there-*Fiona* Rely on someone else to work it - *Mike* Can rely on someone else to operate – *Fiona* rely on knowledge of others - *Fiona* Someone else has the equipment - *Fiona* the task is done by someone else *Fiona* There's a way round using it - *Helen*	"The Hole-in-the-Wall. I have no idea how to work it. *Helen*, when she is there she gets cash," *Mike* 1 (video player) "Yes, I don't even know how to use it. My wife puts a tape on for me, whenever, I don't bother about it, I should, she says, if ever she, if she goes I'll have to learn how to use it, but until then, I'm not too bothered about it" *Mike* 1

Table 22 Non adoption in Group 1: Reliance on others

Having developed this schema from the responses of Group 1 interviewed I proceed in the next section to a more detailed investigation of the features drawing on all the survey data.

The literature review on non-adoption and resistance offered many types of reasons why people reject ICT. For a comparison with the reasons given in this selection of interviews, the IT for All study gives a number of reasons people give for not adopting ICTs. One of the tables is repeated here, giving the 'barriers' suggested by people that put them off adoption ICTs.

Barriers	All who mentioned any barrier
Too Expensive	41
Don't have access	31
Not relevant to individual's life	28
Don't see the need for it	26
Difficult to understand	23
No one to help learn about it	15
Lack of time	9

Table 23 Barriers using ICTs, IT for All Survey 1998

These are very similar to the reasons given in my study, which was approximately contemporaneous, and illustrate quantitatively the general

feelings in the population at the time. The cost, or apparent cost was a common factor for many people, but often associated with another reason, in particular, the lack of relevance and a specific need. Lack of time and knowledge, or the resources to gain knowledge are also important. The examples in the tables indicate that there is much behind these basic explanations, so the rest of the chapter is dedicated to delving deeper into the concepts and processes of relevance, need, knowledge development, and resource allocation.

9.3 Analysing the Non-adoption Reasons by the BEAN Framework

The empirical research focused on looking at encounters and coping with new ICTs though the BEAN structure I introduced previously. In this section I examine the data though each of the categories: what can we say about non-adoption and non-use by looking at people's activities, their social network, their background and through particular salient events. For example there are many reasons for people not being interested in a new ICT. This framework highlights different reasons for this lack of interest, and implications for activities and relationships. Using the BEAN framework allows a systematic trawl though the data, building up a picture of the *context* of non use in a comprehensive fashion, that can be then used to investigate cross over of activities and knowledge between domains of life, and the importance of networks in adoption and use.

The Activities section looks at non-adoption and non-use in the context of the main activities of an individual's life : their home life, employment, their work, community activities, and family. Within these broad domains it looks at particular activities and how these relate to no adoption and non-use. This covers activities where there are existing ICTs available, and other activities where new products and services were being developed and marketed.

The Social Network perspective looks at the influence of other people with whom an individual has contact. Our social network can influence whether

we are able to or want to adopt an innovation or technology. This includes looking at the importance of significant others as sources of information and help, the shifting of responsibilities to others and issues of identity of ICT users, and self-identity as a non-user constructed in a social context.

Personal background, past history and experiences shape our current usage, skills, resources and attitudes to ICTs. This perspective covers attitudes to new and existing ICTs and how they fit into 'life themes', and issues of life stage and the life course, such as the importance of age and family status. This perspective covers resistance based on subjective values and judgements about technologies, and direct negative experiential reactions. This includes 'gut-feeling' reactions, considered resistance based on moral judgement, and fear and insecurity about particular technologies.

Events can also have an influence on non-adoption, just as they influence adoption. The direct experiential reaction mentioned in the background can come from particular events which put people off adopting. Other events can change personal circumstances to make use more difficult. Conversely lack of events can be significant, as a very stable lifestyle may offer no opportunities for change and adoption.

9.4 Activities

Understanding non-adoption in terms of everyday activities is probably the most obvious starting point: if I do not need a computer to do my job, then in general I will not use one. We all use tools in our everyday activities, in employment, in leisure, home life, social life etc. Particular ICTs can be used to support particular activities, some ICTs are more general tools that we can use for many tasks. The tools we use depend on our activities and on the state of innovation of technologies and services based on those technologies. Of course different people doing similar activities will choose to use or not use different technologies, but only so far as they are appropriate, and depending on all the other factors discussed.

The first main reason for non-use is that we have no use for specialised tools if we do not do the activity that the tool was developed for. For example, many of the retired people in the study did few activities that would require them to use a computer or a mobile phone. They do not work, so productivity tools are not important. Equally, some people are not interested in current affairs, and do not read the paper or watch the TV news: a 24 hour cable TV news service is not relevant to them.

Secondly, even though an ICT could help us with a particular activity, according to commentators, the innovation is frequently not seen as necessary, interesting, or an improvement over existing means and equipment. New computer learning technology has great potential for use in schools, but if it is unreliable, the teachers will not use it. A business could replace a receptionist with an automatic answering and exchange system which would save costs, but they may consider that they may also lose business by not having the initial personal contact. This ‘unnecessary’ or ‘uninteresting’ explanation is a rational judgement about the technology, based on current practice and norms, and attitudes to and experience of previous or existing technologies.

Third, tools cost, money, time and effort to appropriate: the investment in equipment, running costs, learning and using (Dholakia, Mundorf et al., 1996a). If we do not have access to enough money or time to spare, then we are restricted in our ability to adopt adapt and use an innovation. Many people may want a computer at home, but do not earn enough to afford it. An employee could benefit from a computer at work, but if their organisation does not provide for maintenance, then the machine may go wrong so often that they cannot use it efficiently. We also need to commit time and money to tracking new innovations as they appear, if we are to assess whether or not they could be interesting or useful to us. If we do not do this, then we will not be in a position to make a choice.

Fourth, without appropriate knowledge it can be very difficult to adopt, implement and use an innovation. This includes both learning about the

technology, and coping with changes in activities as a result. Once on the technology adoption ladder there is generally a constant demand to update knowledge about uses, particular for the future introduction of further technology. Lack of this knowledge, and importantly the perception that lack of it is a barrier, is an important factor in non-adoption.

These four types of reasons for non-adoption related to activities are illustrated in the following examples, showing how and why particular daily activities of the respondents lead them not to use or adopt. However looking at activities alone does not give the whole story: they do not tell us why we do particular activities, why we allocate our resources as we do, how we have developed particular attitudes, and where and from whom we learn. For this we have to look at relationships, particular events, and the background of an individual or group.

We can also see how and why people may adopt in the future as their activities and the technologies change and become more relevant. We change our activities, and new technologies and services are developed that aid new areas (sometimes new activities are entirely related to emergence of new technologies). We can obtain more resources and develop new skills, and technologies themselves can become simpler and cheaper. We can also learn and change our attitudes towards technologies being used for particular activities, where previously we have resisted them.

It is not always a one way process; it is possible to stop using a technology as well, as activities, resources and attitudes change. In a period of rapid innovation there is also a process of upgrading technology, or changing to different service which involves stopping using one product and starting to use another.

9.4.1 Examples of common themes from Activities perspective

Here I give some examples from the four categories mentioned above: lack of need and perceived irrelevance of innovations, lack of satisfactory technical and service development, limits to resources and freedom to

innovate, and lack of knowledge. These themes cut across all types of activities, at home, work, in social and community life etc. These examples will be followed by more specific examples related to special activities in the next section.

Lack of relevance and need for new ICTs

At the time of the research a common response to questions about newer ICTs was that they were irrelevant, uninteresting, boring or appeared to be no better or worse than existing practices and facilities related to an individual's activities. In Group 2, Ruth knew that other people used the Internet, but had no interest herself:

> Em, some of my students have it but other people have done it. No I don't really have anything to do with it, I just know it exists in the lives of my students. Ruth 3,1

Her mother also could not see the relevance that a computer would have to her retired life:

> You'd better ask him but not if I can help it. I don't see the sense. We don't have the need for it. My brother is a widower. He's financially much better off than we are. He's got a lot more time though. He does a lot of voluntary work with his computer and he's got the mentality where he can sit all day and works things out, and like Maurice, Maurice makes his work. That's his em, bread and butter. But it's not even a smear of jam to me. Dot 3,1

She gives a number of reasons, including the cost, her age, the way of thinking, the amount of time she has, which all contribute to her lack of interest.

Some non-adopters *were* interested in technology developments, and could see how they could use them in their everyday activities, but were not interested in adopting them until they were more developed, or the uncertainty over their future development, especially standards and early obsolescence was resolved.

Two examples refer to digital television services which were just being launched at the time of the second interviews (1998). Both Andy (Group 2) and Amanda (Group 1) were interested, but in different ways were not committed to adopting.

> James: I've got photographs about information technology and the use of IT. Some you may have no opinions on, others you might know a lot about. Have you come across digital television, for example, and digital satellite?
>
> Andy: Not much. I've no interest in it at the moment because the DVD thing is going to come which will be more integrating the computer and the television. In another few years you'll have the one bit of hardware. Computers already have television receivers in them so I don't see the problem with integrating the two completely, video, television and computer all in one go. Andy group 2:2

Andy had a model of the future development of the technology, and digital television did not fit that model, so appeared to be of no relevance. Amanda's model was less specific, but generally informed by the rapid changes in technology, as well as her lack of pressing need for the technology today:

> Amanda: We did and we probably should have actually because they were cheaper to install in the first place but at the end of the day we don't really want a hundred odd channels with cable. We've got their connection there, right up beside us for cable but... Sky dish.. I don't know which, if it's worth getting Telewest in if it's going to be overtaken by something else so we weren't really that bothered. Amanda 1:2

This expectation that the technology will get better, and in the future there may be a good reason to adopt, is the delaying strategy discussed in the literature review. Another example from Group 1 is Fiona's husband, who wanted to buy a new computer for their children and business, but kept putting it off, as new, better models were continually being promised by the manufacturers. The lack of a need and an interest means that it is easy to ignore technologies, even when they are appearing all around. When Valerie was asked a general question about new ICTs that she might encounter at work or from friends she was rather vague:

> Back to the technology, have you noticed any sort of developments in new technology around where you live or just it being there? Can you think of anything, like computers, Internet or screens with information?
>
> Not really that I've aware of. I mean they could be there but I haven't taken notice *because I'm not using them* and because I don't observe things very much. Valerie 1:2

It is not something she has a particular *intrinsic interest* in, and she is happy to just ignore things that she does not notice.

Lack of time and space

Time featured several times in reasons for not adopting ICTs, both at work and at home. The process of adoption is seen as taking a considerable amount of time that is not available to a busy person. Someone with a busy

job, and many responsibilities and activities in all aspects of their life cannot find time to investigate and learn new technologies. While workplace and certain domestic ICTs are meant to enhance productivity, and save time ("time enhancing" (Robinson and Kestnbaum, 2000)), entertainment and leisure ICTs are generally designed to fill as much time as is available, something a busy person is not interested in or able to adopt. Television service, computer games, and the Internet are seen by some as time-wasting devices. This is in contrast to those such as Aiden and Ross who saw them as providing activities that they *liked* to fill their time with[182].

An example of a busy person was Fiona (Group 1). She uses a computer and electronic home banking in the office, she has a mobile phone, and deals with all the technology in her business, but in general tries to keep away from new technology unless it is useful for her "If it does work, something you use." Fiona 1:1. She is busy: with 2 children, a business, several hobbies, building a new house, and participation in local organisations, anything that does not help her save time for things she wants to do, she is not interested in.

Space was another factor that was mentioned by some people. Ruth (Group 3) gave lack of space to put a computer as one of the reasons that she could not easily spend time learning and using the machine in her home. Her 'lack of space', however was not entirely due to the physical lack of space, but more a space that she could call her own, in a place that was not already set aside for something else, such as the children's living room, or her living room. Her need for a computer in her own space was contrasted with the computer rooms that her husband and children had. In this case it is not only the activities that constrained space, but her attitudes towards that space, and the way it was shared with her family.

Expense, infrastructure and resource limitations

Our activities and occupations provide resources to adopt and use ICTs. Most people find those activities a limitation. Money is the principal limitation,

particularly personal income. The unemployed and children have very little disposable income, and many others, such as the retired, have limited resources to spend on expensive equipment and services.

Aiden (Group 4), who is 19 and periodically employed in menial work, gives some examples:

> Colin doesn't [have Sony PlayStation]. Ross had a PlayStation but someone broke into his house. Get this, the only thing they took was the PlayStation. We reckon it was someone that knew where it was, because it was like they just went upstairs and grabbed the PlayStation and went back out. That was only a couple of months ago. Since then he lost his job so he's had no money to get another computer or anything. Aiden 4,1
>
> James: Is it the sort of thing [a computer] you'd buy if you had a job?
>
> Aiden: That's a tough one. I would like a PC, but they are pretty expensive, just to get the basics.
>
> James: How much are they?
>
> Aiden: About £1000. I know you can get one for £6-700, but if you want a decent one. Even if I did get a job tomorrow I wouldn't be prepared to spend £1000, I've never bought anything worth £1,000 in my life! Aiden 4,1

Neil (Group 2), who lives in a two-income household and uses a computer for work and freelance work is also constrained in buying a computer:

> Yes, we did have. I sometimes Noel used to lend me his lap top and I used to have that at home for a while …we would really like one if we can. But again it's an expense that at the moment is a bit difficult. Neil 2,1

Helen (Group 1), who is retired, summed up their ability to spend money :

> “ it will depend completely on how our financial side is. That really governs half of our things...” Helen 1:1)

For personal spending some people have discretion, they have enough income to pay for many new products, but it comes down to priorities over spending on other activities. This was Valerie’s view:

> James: I don't know if you've noticed any [computer] shops coming around Edinburgh?
>
> Valerie: Yes, I have, yes, I've even stopped and looked in the windows.
>
> James:... not tempted?
>
> Valerie: No. No because there are other things that I would rather do than that.
>
> James Yes, do with that money.
>
> Valerie: Like going a holiday. (Valerie, 1:2))

This trade off is not always against adopting the latest technologies, as Andy (Group 2) admits:

> James: You don't have a 'phone at home?
>
> Andy: No. I don't have a modem so it's just like, yeas living in the 1960's, no 'phone, no cable, tiny wee crap television. But I've got this really good computer (laugh). I've got, yeas the computer's in the time warp that this world lives in and the rest of my home is in another part of the time warp. Andy 2,1

Despite having very little money, his priorities are towards his computer, and also material for this art work, such as books. He saves and spends his money on these things rather things that others might see as more important, such as a telephone.

In the workplace there are also financial constraints on spending, with decisions often made to a plan, and by others: a primary school, (Valerie, group 1) has less money to spend on new equipment and maintaining technology than a multimedia design workshop (Andy, Group 2). One's job, and the control one thus has on spending are important factors in being able to adopt new ICTs.

Finance is not the only constraint. Obviously in the workplace there are constraints on appropriate spending, rules about what type of equipment is necessary etc. The same occurs at home, where one person's decisions to adopt and their usage patterns are shaped and limited by the others in the household. More concretely, there are limits on availability of technology and of infrastructure. Amanda (Group 1) wanted to use a mobile phone at home, but did not have reception in her new flat. Trevor (Group 2) wanted to have high speed Internet access, but the local exchange in his village was not equipped with the necessary technology. Trevor's partner opened a new workshop that did not have telephone access, but could not use a mobile phone either:

> We've got a mobile phone, you get very good reception in and around Inverness and then as you drive up North you're fine up to as far as Invergordon. If you go further up north, you have a tiny window in Golspie and then nothing until you get to maybe Thurso. Liz got herself a workshop just outside Invergordon. There's no phone there. The first test was could I ring her from here and get through to her mobile phone, and could she ring out on her mobile. She had this awful reception. Trevor 2:2

In short, there are number of reasons why our activities constrain our ability to adopt a new product, even if we want to, as Ruth says (although she was later given a mobile as a present):

> I'm doing such short runs but the one place I do see it. If we were going round again and I was not, if I was travelling with the kids for instance between Edinburgh and Glasgow, I would get a mobile phone then because it would be jolly useful for all those days well in the days when cars used to break down and all the rest of it and yes, I think they are very useful. Yeah. I mean if they were proportionately cheaper I guess we'd have one. Ruth (Group 3)

Lack of Knowledge

Many of the activities, either home or work, that the respondents engaged in were being 'computerised' or could benefit from the use of a range of technologies. However it is difficult to adopt and use them without already having appropriate knowledge developed and used as part of current activities, or without access to training and the assistance of others (Hirschman, 1980). Lack of knowledge can also come from not having had experience in the past, which will be covered in the section on Background and personal history. Several people complained that they had not had training on computers at home or college, and therefore had not acquired the skills and confidence to use computers. Mary (Group 3), Amanda (Group 1) and Ruth (Group 3) mentioned this. Dorothy (Group 3) said she had retired before computers were introduced to her job, as did Mike (Group 1). It must be said that others did not have this experience either, but actively went out their way to make up for this as they saw the skills becoming important. Many people in the study were obliged to start to use computers, and struggled because of lack of knowledge, and had to acquire it from somewhere. Often they turned to friends and family in the network. Many people have access to advice and help with ICTs though their work, friends or family, but since they are not interested in new ICTs, they do not use this resources. Relatively few people did not know someone who could help and advise them if necessary.

9.5 Key domains of Everyday Activities: Work and Employment

There are two main domains that encompass most everyday activities: home and work. The following sections look in more detail at a range of situations in which the respondents did not or could not use ICTs related to their work activities and home life. It is worth bearing in mind the different sorts of activities at work that could make ICT relevant: communication and information sharing, information search, information creation, and management of information, projects and processes [183].

9.5.1 Employment and Work

There are still many people who have no access to work-based use of ICTs, despite many industries embracing them. In 1998, midway through the study, 3.5 million people in the UK had PCs at work[184], by 1999 it was 5.3 million. This does not include users of other ICT products specific to different activities and industries: a great many people use information and communications technology, and industrial control technology at work.

There are a number of factors related to work and the workplace that are linked to non-adoption and non-use of ICTs. First those who do not work, or do menial work are excluded. Second, many jobs do not use ICTs, or are only slowly adopting them. Third, the workplace or employer is a restriction on the adoption of new ICTs.

9.5.2 Non-working

Since many ICTs are work tools, those who did not work had little contact with them. Table 24 with figures from a UK study shows that those working are much more likely to have a PC at home than those not working.

Work status	Full Time	Part Time	Not working
PC at home	45	46	27
Expect to have PC in 4 years	71	76	42

Table 24 Expectations of Home PC ownership according to work status (1997 Motorola Survey)

In the study there were many people who were not employed, at least some of the time. including the retired people, those at school, students and the unemployed. For those not working there are several reasons why they might not adopt particular ICTs. First, they do not need the tools for work, second, they are not provided with training, third, they generally have less income to buy products and services themselves. These problems generally apply to retired people and the unemployed, since children and students have access to computers at school or college, and some can rely on their family to provide technologies at home, or give them money[185].

9.5.3 Menial work

ICTs may be a part of many professional jobs, but they are still largely irrelevant to menial jobs where there are no telecommunications, and information tasks. For example, Aiden and Ross in Group 4 did various jobs cleaning and making sandwiches. There are increasing numbers of fairly unskilled jobs that do involve using ICTs, but often in an very limited manner, and with little control or opportunity to innovate activities. These include machine minders, shop workers, parcel delivery, meter readers, etc, where the technology has become a simple reliable tool.

9.5.4 Work activities not associated with ICTs

Many activities are not associated with ICTs use, or have minimal need to use ICTs. While the Internet and IT ‘revolutions’ are changing this rapidly, many jobs have still not been ‘informatised’, and those who do them may see ICTs in general as irrelevant to what they do. In the survey, three professions appeared to make limited use of ICTs, according to the respondents: teaching, business management and art. There were four teachers: Valerie and Amanda (Group 1) in primary schools, Mary (Group 3) in a special needs

school and primary school, and Ruth (Group 3) working with adults with learning difficulties in a further education college.

Valerie, Amanda and Mary very seldom had to communicate outside the school, so had no need of communications tools. They almost never communicated with teachers in other schools, or with outside organisations[186]. This was in contrast to many of the other people interviewed, who needed and adopted communication technologies. While they used computers for writing reports and as a teaching aid, neither could see the benefit of the Internet for such young children, especially with only limited classroom access.

Fiona (Group 1) ran her own business, a nursing home, She used a small computer to do her work, and had an electronic banking system, but did not feel the need to upgrade, use the Internet, or even to use her mobile phone. The existing technology, the nature of her business, and her everyday routines made any more technology irrelevant to her.

Nigel works as a sculptor and finds no need for information and communication technology. His work as an exhibition curator obliges him to have a computer, a fax and a phone line, which he reluctantly uses.

The supply industry and many innovators in these fields have developed and use new ICT technologies: there has been a huge development of Internet applications for schools of all levels, many businesses are making extensive use of the latest technologies for communication, marketing, and management, and artists (such as Nigel's friends Trevor and Andy) have really taken to new innovations as creative tools and a means of developing and promoting their business. However the respondents in this survey did not see the relevance or need to adopt the technology at that time.

9.5.5 Unsatisfactory technology or content

The lack of apparent relevance of ICT to an activity is often because there has been nothing invented that would serve it satisfactorily. There many be trial systems, or innovation and adaptation to the activity might be possible,

but currently available systems are not good enough, not relevant enough, too expensive, not reliable enough or not supported for that activity.

In some professional jobs, basic technologies are sufficient. For example, at the time, ICTs were only relevant for some aspects of education. Ruth (Group 3) especially, did not use ICTs for her teaching people with learning difficulties, although other parts of her organisation provide ICT access for some of her students. Ruth also managed not to use the computer for administration. However things were changing, as shown in the example in the previous chapter, and it was becoming more relevant.

One of the products of convergence has been the TV Internet set top, which was available on the market to some of the respondents. However, it has limitations on its use, and Bob (Group 4) did not see it a technology he could make use of:

> James: Have you come across these Internet boxes that you can surf the net on the TV?
>
> Bob: I've seen and read about them, but I'm much happier with a computer. They say stuff like you don't need a computer to surf the net, you can use your television. But how do you store what you find? When I surf the net, I'm doing research, trying to find stuff to download for Delphi,, or whatever. [Bob 4:2]

The performance of a new technology is often compared with the existing facilities, methods and technologies currently used. In these cases a rational decision model of adoption can be applied. Judgement is made can be made on the performance, benefits and costs of a new technology, compared to existing means, and also the costs to switch to a new technology. If existing technology or methods seem perfectly satisfactory for doing the job, given the experience, knowledge and resources available there is no need to change.

9.5.6 Restrictions on use

Often one is restricted from using an innovation, despite a desire to adopt it, due to restrictions imposed by others, more notably in the workplace, although in the home there are common instances. Restrictions in the workplace include the employers not investing in new technology, or only

letting certain people use it. Non adoption can also be the result of lack of provision of training and learning time for new tools, no budgets for experimentation and individual initiative in adopting new technologies. As well as an employer restricting people from adoption, most jobs simply do not give people time to sit down and learn how to use particular technologies, whether one is employed or self-employed. In the schools and colleges, the teachers had to book limited time slots on the computers to write their reports, and did not have the time to experiment and build confidence.

Not all technologies are time savers: information technologies such as the Internet may provide a great source of information, but only if one has the time to search for it. One example is Maura (Group 3), who knew that there was useful information on the Internet, but there was too much of it, making it unsatisfactory for her work :

> Yes, it's only just come, I haven't used it yet. I keep wanting to, I had a look once and I was overwhelmed with the amount of information and I thought, I can't wade through this. I was looking for information on dyslexia and there are thousands of entries. I feel for some things it's an awful waste of time, it's going to take a long time to find out what you want. Maura 3:1

The lack of skill on the part of some respondents did not make it efficient for them to use the computer.

9.5.7 Pressures of Work

The time to learn how to use the technology was also an obstacle in a busy life with other priorities, when there was not other incentive to learn. There are limits on the amount of time that one can spend using and learning a new technology, as was suggested earlier. Trevor (Group 2) is busy with two jobs, and found that a program he had bought and had never used:

> I bought software to put on mine like Illustrator which I put on, cost me at the time about £400 and then I realised two years later I'd never ever used it. So I took it off again. I'd only opened it a couple of times thinking oh I'll get round to using and I'll have a look at that some other time but I never got round to it because I never needed to use it so I never got round to - you know it's that sort of. I'll explore a little bit every now and again … With me my twin jobs are as a freelance artist which is following my own thing and having an idea of what I want to do and running a business and it makes a heck of a difference. You spend all your day sitting at the thing. When evening comes, unless you're a complete obsessive, you don't want to sit there and you have a social life as well, you

> don't want to sit there taking it apart you know, no I'm not an investigative computer person at all. Trevor 2 2

In this paragraph Trevor highlights the experience of computer fatigue, where he has reached his limit of using the technology, and cannot face spending any more time with it. Despite being a heavy user, he also has a very strong desire to limit his use. This limit is expressed as a boundary between is work life and his social and private.

9.6 Key Domains of Everyday Activities: Household life

In and around the home there are many opportunities to use media and communications technologies. Over 90% of households have telephone and television, and many have extensions and enhancements to these technologies, such as answering machines, faxes, VCR, video games machines and satellite TV receivers. Desktop Computers and mobile phones are designed and marketed to home users for entertainment, working at home, managing household, social and family life. However many people appear to be uninterested or unable to invest in these technologies. Even in 2000, nearly 50% of the population did not expect to adopt the Internet[187], and the penetration of cable TV does not rise above 30% in most cabled areas in the UK. The technologies behind these products may eventually become commonplace as it is reinvented and attitudes change (‘Internet will be like electricity’), but I want to understand why many people have not adopted and do not use particular consumer products and services in their homes at this stage of innovation and diffusion.

There are a number of reasons for non-adoption in ‘home’ and ‘private’ life from the point of view of activities. Home activities include domestic work and maintenance, family upbringing and management, personal finance and health, hobbies and leisure interests, entertainment, the pursuit of a social life of friends and family, involvement in community life and engagement with political and current affairs.

The study focused particularly on a number of issues directly addressed by technology innovators: shopping, entertainment, media use, activities shared with friends and families, and hobbies. When I looked at particular types of common activities, I found that use of ICT was being rejected, or ignored for a range of reasons, partly to do with the technology, but often to do with a lack of interest in the activities that make use of the technology.

9.6.1 Media, Leisure and Entertainment

One of the main roles of the home is as a space for leisure activities, play, for entertainment, hobbies and socialising (Argyle, ; Kelly, 1983; Dyer, 1992; Rojek, 1995; Deem, 1996). Since the development of radio, ICTs have become increasingly important in filling that leisure time (Morley, 1986; Rojek, 1995; Robinson and Kestnbaum, 2000). Television, radio video games and music systems are established systems, and now leisure use of the Internet is becoming increasingly important. However, while the electronic media is very important, there are also many people who are low users, and non-users of common technologies such as the TV, radio and VCR. Why is this?

Here I focus on media use: first I consider how the respondents use the media in general. Home media use is something easily taken for granted, but there is a wide range of uses of media at home. We use media for information, for entertainment, for keeping up with current affairs, for education, relieving boredom, or just passing the time and relaxing. In the study there were a number of people who had very limited media use, and were not particularly interested in adopting new media technologies or channels. This is in contrast to others who had the TV on all the time, and read as many newspapers and magazines as they could get their hands on, and those who would read the paper, some magazines, and use the TV and radio regularly. Other studies have shown that those who are heaviest users of personal computers tend to be heavy users of conventional media (Robinson and Kestnbaum, 2000). People value the media in very different ways, and have different opinions about how and when it should be used,

and its appropriateness in different circumstances. These circumstances change too, as activities change. Fiona's husband (Group 1) for example, had been very ill and watched television a great deal, but as he got better, he stopped watching.

Mary and Terry (Group 3) do not read newspapers, and avoid watching the news on television. They use the TV for recording and watching some movies, and Terry likes to watch some other programmes. Keeping up to date with current affairs is not something they are interested in, and would probably not be interested in on-line news services:

> James: Do you ever read things in the newspaper about... either in the special supplements or
>
> Terry: We don't read newspapers that much.
>
> Mary: No Terry, no, no, no, I buy papers twice a week, apart from you.
>
> Terry: They're all just bought for the jobs. [Mary+Terry 1 G3 : 928 - 928]
>
> Mary: No. I don't even watch the news. I used to buy newspapers when I was looking for a job. I like doing crosswords and if I have to spend half an hour somewhere with nothing to do I'd buy a newspaper but I would do the crossword and glance at the headlines. I just always had such a busy life. I mean it was really, really busy especially when I was single, I was out every night. And when I have to time to read, I just love reading fiction and I'd rather do that than a newspaper. That I really enjoy, newspapers bore me so I didn't bother. [Mary+Terry 1 G3 : 928 - 928]

Amanda is similar in her non-use of newspapers, although she is mostly restricted by time. She uses the radio for current affairs.

> How about reading, do you read ?
>
> Yes I try and read a paper once a week at least. I am not very good at reading the paper, I tend to buy and hardly read any of it, or read it a week later of something.[Amanda 1 G1 : 486 - 492]

The same applies to Valerie:

> James: What paper do you buy if you buy one?
>
> Valerie: The Scotsman
>
> James: Do you have a Sunday paper as well?
>
> Valerie: Too much reading. Laughs (Valerie 1,1)

She just does too much reading in her work to want to spend time reading at home, something that she felt equally for books as well as newspapers, despite being a graduate in English Literature.

Andy (Group 2) has the TV on all the time, and reads a great deal, but has a dislike of current affair and news that puts him off reading or watching the news:

> I used to but I just have become so cynical. but I don't even watch the news. I don't buy newspapers, I very rarely watch the news so I don't really know what's going on in that detail. I mean folk are, you now, terrorists acts or goons, things are happening and, you know, it took me about three days after the Gulf War to know that it was on. That sort of thing you know there's these major things happening and I don't hear for about two, three year or I just see it in the headlines when you go into the shop and you see the headlines in the newspaper. But I don't need this, I don't need to know that. I mean why do we need to know that? Do I really need to know that Saddam Hussein's got a super gun or it's like, because it's all a fucking joke. It's just like, it's the same game being played out everywhere. [Andy 1 G2 : 443 - 443]

The important news for many people does not come through the media, but from face-to-face gossip[188]:

> Alternative news source No not really, no, just what people have told me, really. In this are, well you'll get it in the Oban Times, but, just heresy, you get in when you go into the shop in Connel, the news of the day, I hear it. [Helen 1 G1 : 457 - 457]

There are several reasons for not using current affairs and print media in general: disapproval of the content, lack of interest in current affairs, lack of time, preference for spending leisure time doing other things and an overload of reading. Innovations in electronic media cut little ice with these people, as they currently add very little that could attract them. Several of the respondents also did not watch much television in general. There was an added dimension of disapproval of the medium which was not applied to printed media. Fiona and Valerie (Group 1) both had a negative attitude to television watching as a pastime which will be discussed more on the section on personal history.

With such little enthusiasm for existing media, do new media systems appeal? Although entertainment multimedia such as multichannel TV and video games are very well established products in a certain section of the population, they failed to interest some of the respondents. In fact only two people (in Group 4) had cable TV, and they were both video games enthusiasts too.

For Neil, cable TV does not appear to offer interesting content for them to watch, based on their expectation that sports would be all they could see.

> Neil: There is cable in the street but we haven't got it.
>
> James: Have you ever considered it?
>
> Neil: No, I think five terrestrial channels is more than enough really. I don't think we could - we don't watch television enough to warrant getting a satellite in and Gillian and I have no great interest in the sport whatsoever and that seems to be all you can get on SKY so no, we've no interest in cable. Neil 2:1

Nigel (Group 2) was not interested in video games:

> James: Do you ever play video games?
>
> Nigel: No. No I do not. I do not have a television and I do not have video and I'm not particularly inspired. I've seen people play them and I've followed people playing games but I'm not, I wouldn't say as a sort of recreational thing it's something I'm attracted to at the moment. Nigel 2:1

Nigel was not a user of common existing ICTs, new entertainment products hold no interest. His friend Trevor is more interested in ICT innovations, but digital television is not something particularly relevant to him and his partner:

> I don't know... we've got a knackered old TV and video. I am curious I must admit, but I think we'll resist it for a couple of years. We don't watch much TV but there are occasions when I really do. I just got a free film sent from Spain, a Basque film, I need it more for that reason rather than to watch TV, but then again, I like to know it is there, because sometimes there's something I want to see. Trevor (2:2)

It is interesting that he uses the expression ‘resist it for a couple of years’ which implies that eventually it will be something that he will adopt, even though it is not actually of much use. Trevor’s comments also show the ambivalence he feels over the television, whether he wants to use it or not, and its usefulness. This lack of a clear attitude is common, mixing curiosity for something new, with need for certain uses, the comfort of having the TV just in case, with the knowledge that it is not used very much.

The ‘addictive’ or compulsive nature of entertainment media is well known with existing media, and newer media products are no exception, be it multichannel TV, video games or the Internet. A good reason to avoid adopting a new media service is to guard against one’s own tendencies to misuse it. Andy (Group 2) did not want to get multichannel TV, but for different reasons. He has seen it at a friend’s, so has an informed idea of what it is about and he watches TV all the time, but he fears the consequences:

> I've looked at cable which my friends have, and there's nothing that makes me want to buy it. I probably watch a lot more television than I should, I'm a bit of a couch potato sometimes. Andy 2 2

Many people have limited domestic media use, be it following current affairs, special interests, or entertainment, and little need for new technologies that offer richer, more detailed or more voluminous content. Cases of new technology solving problems of existing media use are covered elsewhere.

9.6.2 Shopping

Some of the key activities of personal and home life are also the target of considerable innovation in ICTs. Shopping and banking were two areas that I probed in the interviews, finding out how people shopped, and their attitudes and even use of new technologies in shopping. I was especially interested in home and mail order shopping, and use of the Internet. At the time of the interviews however e-commerce for the consumer was only just beginning to be developed, far slower than I had anticipated at the time of the research design.

Maurice and Ruth (Group 3) both had rather a negative view of Internet grocery shopping service, although at the time of the interviews there were not actually any operating locally. Maurice did the family shopping on Saturday mornings, and took the children with him. This gave Ruth the only time in the week when she was alone in the house, and could do what she wanted to do. She was not at all happy with the idea of Maurice just ordering the groceries on-line and staying home. Maurice, despite being an IT professional, and working on an interactive retail project, was not interested in the idea either. He already produced a shopping list on his computer and would be completely at ease with the technology, but the Saturday morning shopping was an important time for him to take the children out, and he enjoyed shopping. At the store he actually left the children in the nursery. He was happy to do this since it was one of the few nurseries that would take his autistic son.

Although this example does not actually show how they would react to being offered and able to trial a real home shopping system, it does show that even for the main target market for Internet grocery shopping services: busy professionals with little time, spending a considerable amount of money regularly, and with Internet access, it is not a market to be taken for granted. A new service should not only be seen in terms of practical benefits, but also in term so of changes in routines and relationships, and the other activities that accompany shopping. Supermarkets have invested heavily in attracting people to stores, such as providing peripheral services that are appropriated and integrated by their customers (Stewart and Williams, 1998). A theoretically more convenient way of doing shopping may upset other routines, such that people may prefer not to change.

Other people, such as Valerie (Group 1) and her mother Helen had particular routines and preferences related to shopping that meant they were not keen on electronic retailing systems. Valerie lives next door to a supermarket, and likes to support local shops, of which there are many, rather than visit bigger out of town shops, or use mail order. Her mother enjoys going to the shops, the local shops and the supermarket. As a retired person in a rural area, this is an important part of her everyday life.

When asked about mail order shopping most people were very negative about it, for example Amanda (Group 1) did not like the idea of buying something she had not seen, and worried that the goods would be stolen if left outside her front door in the day time. Andy (Group 2) had had a bad experience trying to buy on-line, with the goods not being delivered.

Despite these negative attitudes in general, several of the respondents used book clubs and were very happy with the service. It is unfortunate that the Internet booksellers such as Amazon were still rather unknown at the time of the study, to see how this application would appeal. Despite promises from the industry, electronic home shopping developed very slowly, and this study was unable to look at any more than the respondents existing behaviour and attitudes to a promised rather an real application of ICT technology.

9.6.3 Banking

This was less of an issue for banking than for shopping, where telephone and electronic banking systems were much more developed. New services such as home banking which are extensions of existing services to customers are often set up in a way that requires the customer to make a special effort to take the service. Technology based personal banking services have often been like this in the first years of their launch, including debit cards, ATM (Automated Teller Machine) cards, credit cards and now telephone banking and Internet banking). Resistance to using these new technologies is a focus of a variety of research in retailing and studies of money use (Foxall, 1994; Singh, 1996; Szmigin and Foxall, 1998; Singh, 1999).

Several of the respondents had thought about getting a telephone banking service, but had never got round to it, the need not being pressing enough.

> No I don't I never signed up for that I probably should of, but I never see the need for it. I probably would if I was keeping a closer eye on my finances. Amanda 1:2

Even the ATM is still problematic for many people, who prefer not to use it (Stevens, Warren et al., 1989). Dorothy is one of them:

> I have and I have my account with TSB. That was when I was working, I have my own account and I've still got it and I've got a PIN number but I don't know, I never used it and I can't remember it and so many banks have closed and I like to go into the bank and the ladies know me and say "Oh good morning Mrs Hendry, how are you today?" and that's so much nicer than sticking your card in and also it's safer. I do not like the idea of getting money out of a slot and you don't know who's around you. I don't like the idea. But I realise that it's a blessing for a lot of people who can't get to the bank as easy as I can. (Dorothy 3:1)

Of course to use these banking services one has to have a bank account with money, which not everyone has. Aiden (Group 4) has a bank account and cash card, which he used when he was working, but at the time of the first interview he only had 45p, and did not use it.

Although banking and control of one's money can be important, for most of the respondents it was not a particularly problematic or critical activity that

was worth the investment of time in adopting all the technical solutions available[189].

9.6.4 Social Life and Communications

How do people keep in touch with their social network of friends and family? There are a wide range of different communications patterns, and use of communication technologies. Some people talk on the phone all the time, others have very few people they speak to, and do not like to talk on the phone or e-mail.

Mike (Group 1) had very few friends, and hardly used the telephone. He relied on his wife to phone for him, and talk to his daughters. Several examples illustrate his reluctance:

> James: He said he hardly ever uses the phone?
> Helen: He doesn't.
> James: Just when he needs,
> Helen: When he needs, that's all, he wouldn't think of phoning somebody up. Helen (1,1)
>
> --- ---- ---
>
> James: Do you speak a lot to your family, do you speak to Valerie on the phone?
> Mike: My wife has more to talk about them than I do. [Mike 1:1]

Not only does Mike not have many people to talk to, but he does not like to use the phone to talk to those he does know.

Andy (Group 2) did not even have a telephone, because he could not afford it. He also did not have so many friends to call. He made his calls from a phone box. However he really did want to adopt, but was unable to due to financial circumstance. Not having a phone also meant he could not connect to the Internet, although he could do this at work.

Sending e-mail as a complement to other means of communication was a common usage among adopters of the technology. However some people still preferred the telephone to do this: Ross, (Group 4) had a number of friends abroad he had met through his sporting activities, and could have e-mailed them from the local cybercafe, but preferred to speak on the phone. Amanda preferred to use the phone to contact her friend in Africa too, rather

than e-mail. This preference not to use e-mail will be illustrated more in the section on background and personal history, as it refers to attitudes to the technology, rather than activities.

9.6.5 Home and Life Management

Some other examples of non-adoption or use of a technology for home activities were given in the cases. Several of the respondents were asked about mobile phones, and did not adopt because they were too expensive, and because they did not think they offered sufficient value in the situations they imagined they could be useful:

> Actually my husband was asking me if I would like one for Christmas but. And sometimes I mean if I was stuck in traffic and wanted to say I was going to be late home or something like that or my car broke down, it would be useful but I don't know whether it's worth having one just for that. Maura 3,2

Compared to those who do adopt, and find multiple uses for the mobile phone, Maura, Andy, Ruth, Amanda and Mary all had a focused idea of what they could use a mobile for, and rationalised their decisions not to adopt on this, weighting the cost against the likelihood of breaking down on the road. This was in the time before the huge explosion in mobile phone use with the introduction of pay-as-you-go system, when mobile phones became much more widespread, and their use more visible. The safety on the road (i.e. breaking down) issue was one that had been a focus of advertising, but it was not seen as a sufficiently important reason for these non-adopters.

Although the Internet is seen as the main source of on-line information today, the TV based teletext system has offered a great deal of everyday information for many years. However, even with this available in the home, offering information, and selling holidays, it does not fulfil the requirements on satisfy the interest of Dorothy:

> Yeah. Don't even use that [Teletext]. No. They sometimes say you can find this recipe and I think oh god no, not another recipe. And if we wanted to go on holiday having looked through brochures which we would collect, we would decide where we wanted to go and then go to a travel agent. Dot 1:1

Even where the technology in principle serves the interest and activities of a potential user, it does not mean that they find it useful or more convenient.

9.7 Issues in Use of ICTs

9.7.1 Restrictions and limits on adoption and use

There are a variety of restrictions on use, such as time, space, money and skills(Dholakia, Mundorf et al., 1996a). Time, for example, was an important factor for people such as Ruth (Group 3),who have very busy lives, juggling home, family, work, and leisure interests. There is little time to sit down and learn to use a computer. The technologies they could adopt would not easily save them time during the adoption and appropriation processes, from searching for information and advice, to learning to use the technology.

There are other restrictions, such as those imposed by authority. Just as this occurs in the workplace, the home has restrictions in adoption and use. Children's use of ICTs is controlled by their parent, such as Daniel and his brothers (Group 2) having their television and computer use controlled. Fiona (Group 1) controls her daughters use of the television, and refused to buy them a video games console. Among adults in these cases there were also examples of restriction in use and adoption, such as John (Group 3) not getting on the Internet since he could not justify it to his wife, and Trevor (Group 2) giving up computer games and limiting use of the computer in general as he tended to neglect his partner if he spend to much time in front of the screen.

In the previous cases, others in the social network are able to exert control to prevent adoption and use. In a similar way some people impose restrictions on themselves. In fact it is difficult to separate the two types of restriction, as often someone limits themselves, because they know it will cause problems, or conflict with others. Self restriction commonly applies in limiting ones use of a technology, but also extends to resisting adoption, despite a desire to use or own an innovation. There may be a financial dimension to this restriction, knowing one has more important priorities for spending money.

9.7.2 Separation of home and work activities

One important driver of computers in to the home has been working at home. 18% of respondents in the IT for All survey 1996 (BMRB, 1996) used a home PC for work, rising to, 27% in 1998 (BMRB, 1999), with 61% of those with PCs in the home claiming use computer for work brought home, and 32% for work from home (1998 figures). This may be for the convenience of being able to do work at home, or because there is too much to be completed in the workplace. Several people in the study had a computer at home to do work, or worked from home using the computer. However many people keep home and work separate, and do not let the two interfere with each other. Sometimes this is in the nature of the job, and the division enforced by employers and culture. Alternatively, it can be a choice to focus completely on work during work time and to forget about work at home or outside the workplace. These divisions can also extend to separate social networks as well as separating activities, and keeping clear boundaries on time use (Nippert-Eng, 1995). For some people, any work activity at home was unwelcome, so the idea of having a computer to do work on is irrelevant. Amanda was very happy to stay at school to do her reports on the computers there, knowing that she would always be able to go home and leave work behind. From outside these case, an example from a middle aged man working in a business promoting IT industry[190], highlights an intermediate and inventive solution to the problem of bring work home :he got rid of his powerful home machine and replaced it with a simpler computer that would not be able to handle his work tasks, but would enable him to continue his hobby of writing. He felt his home life was being undermined by work and preferred to stay in the office until it was done.

In addition, with many people associating computers with work, it was unsurprising to find that some people did not like the idea of introducing a computer into their home, even though they are happy using them at work. Valerie (Group 1) is an example: she used computers at work, and experienced all the problems with them there, and did not want to bring one

home, even though she did work at home. It was partly the physical problems with a bringing a machine from the school, but also the desire not to bring this technology into her home space.

The telephone was an example that several people gave of a technology that they used at work, and therefore did not like to use at home (as also observed by (Gournay and Mercier, 1998)). Fiona and Ruth both look for time at home to be away from other people and the pressure associated with the telephone:

> James: What about your social life?
>
> Fiona: No not necessarily. No I am not particularly good at using the phone outside work hours, and I think also too, telephone and people or both, you are involved a lot during the day, so when I am of I don't necessarily need lots of people around me, or the telephone, so I like to switch off. Maybe I am a bit antisocial sometimes
>
> James: Like using the phone all day everyday, you get a sore ear...
>
> Fiona: laugh, you don't want to sit there all evening phoning your friends, it is not my idea, I like to go and visit them. Fiona 1,1
>
> --- ---- ---
>
> James: And do you talk on the phone a lot to friends?
>
> Ruth: Well that's interesting. I think nowadays I talk far less at home on the phone because I'm spending far more time at work phoning and I'm so pissed off with phoning that I regard it not as the pleasure that I once did but sort of something that has to be done. And I put off phone calls that I used to. I recognise that as well, slightly longer phone bill. I don't phone anyone at home any more, can't be bothered. Ruth 3,1

When they get home, they take control of their lives by *not* using the telephone, a behaviour that goes counter to the 'normal' use of the telephone promoted by industry, that it can put you in control through use. This particular usage of technology has to be learned, just as much as those that involve more 'active' usage[191]. Maura, for example put it like this:

> No I mean for me it's a bit like the telephone, you assume that if the telephone rings you have to answer it but of course you don't have to, you can choose not to and it's the same, I mean the idea that these things are demanding and you have to do it I'm beginning to get a bit more relaxed about that and think right no, if I don't want to do that I don't have to. Maura (Group 3, Interview 2)

9.7.3 Technology Reducing Personal Control

Personal control was theme that came up repeatedly in the conversations as a factor in both adoption and non-adoption of new ICT. Control over one's life, environment and technology is a theme that is highlighted by some

researchers (e.g. (Livingstone, 1992; Mick and Fournier, 1995),). Some of the respondents expected that that owning some of the new communications technologies would actually reduce the control they had over their activities and relationships. Sometimes this was explicit, in other cases just suggested. Fiona (Group 1) is one who articulated this fear:

> I'm actually keen when I'm actually doing things to be away from, I don't want [a mobile phone], I actually find it spoils, say I'm on a train I'm actually on, not thinking about anything in particular, or thinking about something specifically, I don't like to be disturbed when I'm doing that. And also I'm usually pretty well near a phone, I like to be more in control of when I contact people rather than, as you've suffered, rather than be at the beck and call of other people, I like to sort of be more in control. I would feel a mobile phone would impinge on that. I'm not out of control, I'm not out of range, people, I'm happy to give people my home phone number for example, they can leave messages there. I've got phones here, email, so I can be contacted. I've often found, even with family, there is nothing as urgent that it needs a mobile phone that you can't wait another hour to be contacted, I'm never usually more than hour away from something. Even on a train you can use the phone on the trains. (Fiona 1:1)

This reflects her existing attitude and use of the phone, and the value she puts on personal independence. Similar attitudes have also been found in studies of adoption of the mobile phone, where adopters have chosen to use the telephone not to be constantly available, so they keep it turned off (Frissen, 1999). Their use is to be able to make calls, and pick up messages left for them at a time convenient for themselves. There is a non-adoption of a particular feature of the mobile phone. In this example Fiona has a mobile, but keeps it turned off in the bottom of her bag, but knows it is there just in case of an emergency (crisis access).

9.7.4 Summary

The activities that we do in everyday life, from the broad classes of activity, such as work, to the smallest detail of habits, play a role in how and whether we adopt ICT. We do not adopt when we engage in activities that do not offer opportunities to use and learn, such as when we are retired, have a job without real IT relevance, or lack of work support for IT training and access. If the technology does not offer benefits to activities and is not expected to improve efficiency of activities or quality of life, then there is no need to adopt. When there is a lack of resources based on activities, such as income, time, space etc, then we are unable to adopt without a struggle. Sometimes

there are benefits from technologies, but there is no pressure to adopt and no immediate necessity, so it can be ignored or delayed. There are some people who adopted new technology out of interest and a desire to explore and innovate, but normally if we are satisfied with out current activities and situation, and do not want to change and find something new to do, then we will not invest in technologies that could enable us to do this.

9.8 Network

The social network is a source of examples, resources and knowledge. The previous chapters showed the many ways in which a person's network can have a powerful effect on adoption. The same is also true for non-adoption. The lack of knowledge and access to positive attitudes and demonstrations or vicarious trials by others does nothing to encourage adoption. A local group norm of non-use, or a negative attitude towards technical innovation and new ICT products is similar. However the network also is a resource for non-adopters, no matter why they themselves do not use the technology. Their network enables them to get access to facilities, such as information and communication services without adopting it themselves.

The social network not only a source of attitudes and knowledge about innovations, and ICTs, but has a 'social' dimension: ICTs can be an important part of shared experiences and relationships for users, but this shared experience is also important for non-users, in their relationships with others, both users and non-users alike (Holt, 1995). The network is also a source of comparison for personal identity, for examples of users of ICT that can be compared with oneself.

Several of the respondents did not know how to use a product, or did not own it, but got others to use it for them. Here we can see the local economy working, as non-users tap into the resources of the network for proxy use, as a way of non-having to be adopt and use themselves.

These examples include Aiden (Group 4) who did not think it worthwhile subscribing to the cable movie channel, and was able to get someone else to record when he really wanted to see something:

> Yeah, I ken [know] someone who's got SKY movies. My boss, quite friendly with him, he stays across the road. If I wanted, yeah, if I wanted anything, if there was anything coming on a movie channel or whatever I could just say could you tape that for me but I dinnae see the point in the pay per view for the boxing matches. It seems to be hyped up a lot. But I mean you could pay £14 for that and it could be over in the first round ken and that's just, what a waste of money. But that's it, you've paid it. Aiden 4:2

In common with her friend Ruth (Group 3), Mary gets her husband to type for her, as she is very slow with a keyboard.

Maura (Group 3) finds answering the phone in her house annoying when it is always for someone else. Her response to this is to pass the responsibility for the telephone to her children all the time. The strategy of passing on responsibility, conscious or not, was applied by others too. Ruth (Group 3) let her husband deal with everything to do with computers, including dealing with junk e-mail:

> Well that yes. I've concentrated that. I hate junk mail. Maurice complains bitterly about the junk on the, what is it, he's on the autism list of parents and it's full of people just chattering and bitching, carping and moaning and nothing significant. So that that's funny, because I mean yes, lots of junk mail which I don't like, he gets all that junk. Ruth 3,1

Ruth passes responsibility for using the computer, and for knowing about new technology to her husband. In several of the households, one partner took responsibility for using the computer, sending e-mails, making most of the phone calls, and researching new purchases. An example used earlier was Mike (Group 1), who does not use the phone. He does not have to because his wife takes responsibility for family communications.

> I ring... my wife usually rings her, she looks after that side of things. Mike 1,1

Although not directly related to new ICTs, Helen and Mike did not share responsibility for shopping of any sort, including major items, such as the TV and video:

> What about buying large things for the house, the television or the washing machine?
>
> She usually does that, as I have no interest. If she wants a washing machine or television then she gets it.- Oh I am interested in the television, but....it doesn't really worry me, and I do not have the problem that some men have that they always got to be there as the boss doing the buying. It doesn't worry me, I'm retired. *Mike* 1:1

> I do if there is something on and I am going out, I will record it. Quite good for that. But *Mike* he doesn't bother to see how it works, he leaves that to me. If there is anything like that he doesn't bother, I have to do it for him. If he just took his time he could do it. Helen 1:1

In the workplace division of labour is the basis of most enterprises, and includes certain people having professional responsibilities for ICTs. However where management has not provided much training, or made any strict divisions, there is an informal sharing and off-loading of responsibility for ICTs in the workplace. This enables some people to avoid adoption and use of ICTs. For example, in her office Ruth let others use the computer and answering machine for her.

Finally, the network can be used to find out about new technology, to learn about it is a relatively simple way, letting others do the hard work of investigation, adoption and learning by doing, examples of which were given in the chapter on the Informal Economy.

9.8.1 Relationship Problems

In a relationship, one person using a technology and the other not using it can be a good division of labour, especially when it is a result of specialisation at work. However sometimes it can become a problem. Nigel (Group two) has caused some problems with his refusal to adopt new technology, at least according to his business partner Trevor:

> Well, Nigel's not that into computers. He's not a technophobe but he was thinking about it, he used to live with a girl in Leith, when he worked in Leith, that's one reason he went up to Inverness 'cos he split up, but she was computer literate and they were, she was wanting to get a computer. He wasn't against it but he wasn't encouraging her. So he's not a technophobe but he's not, he uses it when he desperately needs to, that kind of thing. he's more a, he's a stone carver, chisel and hammer kind of guy, Trevor 2:1

> He is resistant to... he owns a fax machine, an answering machine, and I ring him up and it's very rare... he'll have one or the other on at any time. The company bought him the computer, but I know for certain in the 6 months he's had it he's done maybe three or four letters on it in all that time. I know he's done his own CV on it. But it's a very very old one. Sometimes I do wonder how he thinks. He tries to tell me not to spend so much time on telephones and do so much on computer, but I sometimes do wonder how he thinks the work is done, how it happens. He's really good at supporting in company business, he's very good at that. Meeting people, networking, ringing up. Trevor 2:2

Neil gives an example of not being about to share his interest in new technology with his friends in the motorbike clubs (even though 'technology' itself is obviously not a problem.

> Most of the, a lot of me bikey friends just kind of piss off if I start talking about them, because they don't understand and they don't want to because they're tradesmen people, and they're oil and cogs guys you know. So no, some of them just aren't interested at all. They like it when I show them things that I've done and they go 'wow that's great' then that's it. And sometimes I can amaze them if I can, by telling them what they can do, yeah, some of them like that but I mean very few of them actually work with computers. Neil 2:1

These friends do not use computers for their work activities, and they are just not relevant.

Many people share responsibilities for resources at home, especially financial, so that one person can veto the adoption by another:

> More or less along the lines of don't buy anything that's not already loaded, and don't buy anything from Dalry Road. It's difficult for me to explain to Maurice who understands the things and who has a tremendous amount of money already invested in equipment, for me to say, look, the money I'm spending on computers I'm taking out of the common pool between my wife and myself. This is my hobby and I could not take £1300 out of the pool to buy a brand new computer, I've got to be moderate in what I spend. John 3,1

Money is not the only issue, ownership of technology in the home, and the space to use it can also be a type of social constructed 'barrier', as Ruth explained:

> Well yes, I mean the computers have been there for some time and I mean people do just generally sort of creep over and use them but the people that have learned how to do it have learned at home and that's an area you see that because Maurice is working on that I don't have a, I have not had until the kids got one downstairs, there's not been a computer in the social space in the house. It's been Maurice's working computer. Em, and I have thought that I mean if that one was just sitting there and he didn't have his own stuff all carefully shielded from prying hands I might sit and play with that of an evening and do things. Ruth 1:1

9.8.2 Circles of Interest: Belonging and Exclusion

The social network provides a source for knowledge, as mentioned above, for division of effort between friends, family members, colleagues etc, with some taking responsibility for new technology and existing ICTs. Those in one's everyday network have a direct bearing on what one technologies are available, and on the attitudes to those technologies. Some people have a network that is largely composed of non-users – the technology is not part of

any shared everyday activities, interests or conversations. For examples Dorothy (Group 3):

> Do you know other people who have got computers? Have other friends got into them at all?
>
> Not really. No, mostly our friends are retired.... has got one in Glasgow but there again she uses it mostly as a word processor. No it isn't a big part of, I would say, the circle that we have. I think we're all just that wee bit older. Oh some of the male members of the church have computers and things like that but em, not.... Dorothy 3:1

Most of her circle of peers are not computer users, and although some may be, their knowledge is not appropriate to the her network. The idea of appropriateness brings up issues of self identity and social identity in a group. Are technology users ‘one of us’ or ‘one of them’. This ‘them and us’ issue can appear as an important boundary between those people in the everyday network, and those on the periphery or outside it. A network primarily made up of non-users presents the members with many obstacles to adopting new ICTs. It is useful to list some of these issues:

- No access to equipment through network
- No access to knowledge/help via network
- Examples from network poor or negative
- Restricted ability to share and discuss adoption on own level
- Exclusion from user/ adopter group

9.8.3 Self image as non-user, users outside network, or intimidated by users in network

Mary (Group 3) claims not to be attracted by the sort of people who are into technology

> ... Well Mary Dewarcatch does [talk about technology] a lot, she was a colleague but I mean I socialise with her sometimes so she's a bit of a friend. She's not ... it's just once a week. No I don't tend to be attracted to those kind of people, I think my friends are probably quite similar to me. [Mary+Terry 1 G3 : 1283 - 1283]

One remarkable thing that comes through in these studies is that most people have access to equipment, knowledge, help and examples though their social network in some way, but still feel excluded from the world or mentality of ICT users. In fact the proximity can reinforce self image as a non-user. In the example I give above from Dorothy, she uses comparisons with others, in her case her brother and son-in-law as part of her explanation

for not adopting computers. Her brother is patient, he has things to do with the technology, and he has money; the son-in-law uses computers as his job, they part of making his living. She is using her network as a source of knowledge about how and why one should use computers, and this reinforces her position as a non-user.

When someone is not interested in a topic, be it ICT or anything else, it can be boring and excluding when others start to talk about that subject. In an earlier chapter some examples were given of people deliberately avoiding information about ICTs. Talking about them also makes people 'switch-off'. Dorothy finds it very boring when her husband and son-in-law (John and Maurice) start talking about computers and feels left out of the conversation. Andy says his sister-in-law feels the same about the conversations he and her husband have. Trevor and Andy bore Trevor's partner and his friend Nigel. For them, computers are a very antisocial topic and intrude into their relationships. Fiona [Group 1] has a friend who starts talking about her computer, and she then just switches off. Mary [Group 3] tries to stop any conversation that goes in this direction:

> Terry:. It will be a topic of conversation [when Maurice and Ruth come to dinner] but I can't imagine it will be the main topic of conversation, Mary will kill it dead.
>
> Mary: It'll kill me dead. [Mary+Terry 1, Group 3]

Amanda mentions that several people in her circle of friends are very keen on computers, but they know to keep quiet about them when they get together. We can see that there are unwritten rules about what are acceptable subjects to talk about in particular, relationships and groups, and in some groups it is ICTs. Some people are not interested in them, do not understand them, or relate them to work, so conversation this subject is restricted. In several of the cases it is a case of women feeling excluded from men's conversation about ICTs- we see computers as belonging to the 'mans' world in a traditional sense. However there is nothing masculine about these technologies, and even this sample shows men excluding men, and women boring women which occurs when people with different interests, and salient problems come together. John (Group 3) gives a good example of the

inverse situation, where his wife and daughters exclude him by talking about issues of importance to them, but which bore him:

> Number two daughter, if on the odd occasion she's persuaded to talk about her job, it sounds so miserable, so hellish, that I don't want to hear about it. Likewise, number one daughter, Ruth. She can get carried away and start talking about the most dreadful circumstances folk have to live in, especially if they're not quite all there. And that depresses me, so I don't discuss their work with them. Even if I do, half the time I cannot comprehend why some things are so important, and others aren't. So we talk generalities, and then of course they suddenly become immersed in clothes, or keeping the house clean, or the price of tomatoes, and I fall asleep! John 3,1

The issue of identity as a 'computer person' or not a computer person is reinforced though social interactions and group 'rules' and norms. Someone who is not interested, or does not understand an issue that is of interest and shared by others in the group can feel excluded as much as those who are interested feel included.

9.9 Personal History/Background

There are reasons why individuals do not use new ICTs, or do not adopt them. Personal history and experience of ICTs, and attitudes formed in the past can play an important role. Lack of education and a background of experience in use information technologies is a poor base to build new skills on, and can lead to lack of confidence and insecurity. Negative attitudes to certain technologies or technology based activities can built up over many years, though experience, lack of experience, and interactions with others. The key themes that come through from looking at people values, experience and background are a moral or value rejection of certain ICTs or uses of ICTs, a lack of knowledge and experience of ICT in earlier parts of their lives, and attitudes developed though negative experiences and experience of older versions of technologies.

9.9.1 Negative Subjective reactions: Experience based rejection

The experience of a technology or service is often far from positive, despite the excitement that other may feel for the same product. Computers and the Internet engage and inspire many people, hence the huge development in the application of these technologies, but they also leave some people cold,

bored, or can even scare them. Amanda is an example of someone for whom the experience of Internet failed to inspire:

> No. My flat mate who was, he's very computer... so I played around with it when I was there. Not really used it much. Used to email our friend in... and he set up a web page…. Used to sort of fiddle around on that but I kinda got bored with it. Amanda 1:2

There are a number of factors for why she failed to engage with the technology, and even resisted using e-mail for a while. The technology and the concept behind the technology appeared to offer her little related to her activities, she had almost no experience of using computers in the past, and she objected to using e-mail on a value basis.

While Amanda was just not interested, Helen (Group 1) was positively intimidated by a telephone answering machine, much to the amusement of her children.

> James: Do you like, when you ring up someone who have an answering machine?
>
> Helen: No I don't, I put it down straight away, I hate an answering machine! I think I am stunned at what I am going to say, I would need to put it down I think and then phone again, but I would rather get the person, and I know the message is there. Helen 1,1

Helen had never managed to find a way of coping with this technology when confronted with it, and is frustrated with her inability to react to the machine, and even suggests that she does not quite trust it. John (Group 3) has a similar dislike of automatic call systems:

> James: The new telephone systems, do you every ring a company up and get one of these machines talking to you?
>
> John: Yes, they're vile. The banking services have them.

These reactions both came from older people, raising the possibility[192] that long past experience and established expectations of the telephone technology become ingrained, so that having to listen to and talk to a machine creates a stronger reaction than in younger people.

A dislike of the inter-mediation of a technology is not uncommon, such as the preference for face to face communications over using the telephone or other system. Helen's husband Mike does not like to use the telephone at all:

> Oh that annoys me, that if you want any information just input dot slash bate, all the jargon and on radio you don't write in or phone in, you surf the Internet, you can get all sorts of information, you can get a lot of rubbish. I'm sure if you've got the time to sit at a

> desk and look at a computer you can get a lot of information and fun, but it doesn't appeal to me. [Dot 3:2]

9.9.2 Subjective and Value-Based Resistance

Our life themes can steer us away from technology, or from applications it is currently applied to. A number of respondents expressed disapproval for the use of particular ICTs, or the services they were being used for. In some cases this was expressing their own dislike of using a particular technology, in others, an opposition to an innovation. The ideas they touched on included a dislike of change, the desire for simplicity, to be away from machines, a preference for face to face communications, and a disapproval of activities that involve being in front of a screen

Several of the respondents expressed their resistance to ICTs in terms of a desire to avoid the stress of machines, the constant barrage of information, and impersonal communications, experiences placed in opposition to ‘nature’ and ‘people’. This resistance includes discomfort or dislike of using ICTs compared to time spent with ‘nature’ or with people, and a higher moral regard for these activities. Fiona for example has little interest in media technologies and uses expressions such as ‘simple non-technical’:

> NO, I just use it for what I need it for. I don't wonder about its workings, or anything else. if I need something, if I am not sure about something, I will ask Ian or one of the girls, and they will keep me right. [Fiona1 G1 : 368 - 368]
>
> Yes, I think so, although, it could be like something you use it for a while, then after a wee while the whole idea loses any sense of interest. I think it is because I like to be outside. [Fiona1 G1 : 374 - 374]
>
> Oh yes, but I am not the best when it comes to bits of information, bits of technology, I like to stick to my own simple non-technical. [Fiona1 G1 : 374 - 374]

Surprisingly, Aiden (Group 4) who spends the days and nights in front of the TV with multichannel cable and video games expressed a similar attitude towards the Internet:

> I've played the vampire, werewolf. Ross has mentioned they've got different rules, for Highlander, they've got rules to play as a mortal, but I've never, I'm not too interested in the Internet. I understand, I do think that it's an amazing thing. Brilliant invention, but for me personally I prefer life a bit simpler. Aiden 4:1

Some people object to the technology itself, or the system that is based on it. Mike (Group 1), despite spending a great deal of time in front of the television, watching sport, was against satellite television.

> Maybe when we're too - and we're not so mobile, you never know we might say we can't drive anymore and things like that, it might come to being but not at the moment though. And I think for the main reason because we're sort of prejudiced against it. Em, I'm sure if we wanted we could buy a dish in and use it. If you think of different things that we spend our money on I'm sure we could find money to do it but *I'm prejudiced against it,* that's why I don't want to. [Mike 1:1]

He is similar to many people in the UK in his disapproval of the satellite television and pay television services, (Moores, 1996), not because of the technology, but because of the 'un-British' commercialisation of television involving the removal of many sporting events to pay TV.

Nigel can not afford a mobile phone, but he also considers the cost of calls undemocratic, and has a moral objection to the system:

> Well I've look at the prices and all that, you know, and as I say I mean, I don't, for my personal use at the moment I don't think it's worth it and I also feel it's an affront to people as well when the cost of calling somebody on mobile phone is quite inequitable so I mean, until they sort out that kind of pricing angle I think I will be reluctant to have one, although I mean I can see you know, see the benefits, no doubt about it. Nigel 2,2

The actual use of a technology can also be the focus of negative attitudes. Mike's daughters, Valerie and Fiona both expressed disapproving views about screen-based activities that could eat into time spent on more 'valuable' activities, such as being outside or with other people.

> James: In general how do you, what are your attitudes to technology over your life?
>
> Fiona: I don't let it take over y life. I am open to any innovations, I will have a look, and probably say, oh yes that is fine. I like things to be fairly simple, and not be surrounded by lots of different bits of equipment. If it does work, something you use. Fiona 1:1

She uses what she needs for work, but at home she wants to get away from it, an attitude she imposes on her daughter to a certain degree:

> We have always gone out for our way not to [have a video games machine]. Laura has a cousin who has got one, so she goes and plays. She is at me for a play station at the moment, same as her friends', but I told her 'go and play on hers'. But I wanted a new computer, I think when we get that I don't mind if they get something they can play on that, but I don't really think that it improves anybody's lifestyle sitting glued to a TV playing games. Fiona 1:1

9.9.3 Self-image and opposition to the technology user.

Self identity as a non-user and the supposed characteristics and identity of technology users is an important theme in the literature on consumption (Holt, 1995). This came up frequently in the interviews, and the section on social network showed how people compare themselves with others in their network. However this goes more broadly into understanding self-image. A neighbour gave me an example of a reason for non-adoption. She had just got on-line and was proud to be a 'Silver surfer' but her friend was not keen, she did not want to become a 'nerd'. The image of visible, computer-based ICTs has long been associated with scientists, engineers and the 'nerd', (groups not entirely unrelated). The idea that computers are 'not for me' is common, and still widely held, and as in this example it is used as a reason not to adopt. It is not only the modern image of the nerd, but the idea that you have to have the type of personality that can cope with and enjoy spending hours in a darkened room with a machine, with the analytical mind and infinite patience, perhaps an image closer to perception of scientists and engineers. Amanda used an expression about her flatmate "he is *very computer*" suggesting he had the mentality to deal with the sort of problems that computer's pose. Dorothy suggested she did not have the sort of mind for dealing with computers unlike her brother-in-law who's "got the mentality where he can sit all day and works things out". These impressions are based on their own experience of watching and hearing about use of computers, and knowing the people who seem to have this mentality. Whether there is actually a difference is another matter, and there is no reason to suspect there is not, but perceptions can be very important, even if the technology evolves so that many of the use problems no longer exist. The issue of self identity in relation to computer has been extensively explored in the literature on technophobia, especially in relation to women and computers, and appears to show strong social influence on these attitudes (Turkle, 1996; Brosnan, 1998).

In the world of ICT and convergence of technologies, the computer is not the only technology that stimulates issues of self identity. Along with the nerd, a character associated with the computer terminal, the couch potato is the parallel for the television screen. The problem is the same, someone who is seen to spend an 'unhealthy' amount of time in front of a screen instead of doing some other more 'valuable' activity. The two sisters Valerie and Fiona had this attitude about the television, video games, and to a certain extent, computers, although this was modified because of practical uses. For Fiona, the country dweller, being outdoors doing things was a valuable, healthy activity, for Valerie, the city dweller, being with friends, learning and consuming culture were valuable. The TV had its place, but only within boundaries defined by these activities.

The mobile phone is another technology where a certain group of users are classified as being different, the brash, loud, 'yuppie', salesperson always on the phone. Andy summaries a common attitude of a non-user:

> James: Is it the sort of thing [mobile phone] you can ever see yourself having?
>
> Yes, but I don't think so. I mean I could see myself with one but purely functional. I'm not into posing with, in fact I just like, when I see folk with mobile 'phones I think fucking hell, because I really don't see much of a need for them. There are so many folk who have them I don't see how, I don't see me needing one. I'm not averse to having one but they're too expensive anyway, they're far more expensive than desk tops, aren't they. the calls cost more, even to call to them costs more doesn't it. It's just like total rip off. Maybe it's more bloody-mindedness, I don't know, no I don't see myself having one but I'm not, if I feel that I need one, if I was in a job that I was travelling around and needed to get, I'd certainly get one. [Andy Group 2, 2]

Despite seeing the benefits in general, his self image is so much in opposition to his image of the 'typical' user that it is more than the cost that prevents him from adopting. In fact few of the respondents expressed this view, as the mobile as becoming an increasingly cheap and widely used technology by the second set of interviews. Nonetheless even among the many diverse users, the way the phone is used by particular groups[193] acts as a powerful social marker, and as Douglas (Douglas, 1996) suggests, our opposition to the 'taste' or consumption patterns of others is an important part of our own identity.

9.9.4 Knowledge and Experience

The previous sections on network and activities showed that many people do not have much contact with new ICTs through their activities and network. Not having the skills, and not having confidence in oneself is a common feature of non-adoption, as was discussed in the earlier sections on technophobia. One important factor that is commonly mentioned, and came out in these interviews is knowledge and confidence based on age. Most people older than 25 are likely not to have used computers at school nor had early life exposure to this technology, gaining confidence, or at least familiarity with computers. Nonetheless, there are of course many older people who have adopted computers though work, education or personal interest. Experience though work and education, where one has been obliged to learn how to use computers, and generally given the support to do so helps build confidence as skills develop. As many of the cases have shown, those with little or no training, and without having had everyday use of the computers at sometime in their life, can lack confidence in themselves and in the technology later on. It raises issues of knowing the limits of the machines, and feeling that the machine is not in control of the situation, even when it is being 'temperamental'

While lack of knowledge may put some people off adopting, experience with technology can make people wise to innovations, cautious or sceptical about buying the latest thing. Noel, one of the most knowledgeable and keen adopters of IT bought a new palm top, but only after a delay:

> The process was, I was using a Psion series 3 which was very good except I found it's, I do a lot of writing on it, typing, I can actually type quite quickly on it, and it's, I actually like writing, tend to prefer to write away from sort of places like the office here or even writing from home, I like to write on the train or if I'm actually in a cafe and write, thoughts straight. So the old Psion series 3 the screen was too small to work comfortably. And the new series 5 has got a much bigger screen and it's much nicer to work on. So I was, that was the reasons I talked myself into it and to be honest, yes I actually like using the Psion as well. So when it came out, I waited a reasonable mount of time for the first batch of series 5s to come out with all the problems, then went out and bought one. [Noel 1 Group 2 : 375 - 375]

9.9.5 Life stage

Studies of adoption of innovations, especially ICTs, find that age is an important predictor of adoption and attitudes, with older people being less likely to adopt. Younger people are more likely to engage with innovations, particularly when they are made available through school and college, through their families, and are necessary for work. There are also difference in attitude across ages, with younger people less set in there ways, more enthusiastic about communicating and staying in touch, with more mobile lifestyles than many older people. However at all ages there are many people not adopting new ICTs. Many non-adoption factors apply to everyone, such as lack of money, lack of training, but these are closely related to life stage. An unemployed young person and a retired person may both have little disposable income, but for different reasons (See Appendix for fuller account).

Old Age and retirement

Looking at activities we saw that retired people do not have the need or opportunity to adopt ICT through their work, and many do not participate in education. Older people who have had grown up families are not involved in the process of adopting ICTs for their children, or for the management of their families.

John (Group 3) is certainly not particularly resistant to new technology, but he finds that most of what he has acquired is perfectly satisfactory for what he does, and he feels no pressure to get the latest thing:

> I see the desk top boxes are going to cost us £15 extra on our electricity bills and the price of an entire power station, because they're running all the time. Again, it may well be keeping up with the Joneses. If I as being colour blind am happy with the colour presentation on my present set, and because of my great age I can't see any flicker or shortcoming in the picture, why do I need a digital set? That wee Walkman on the stool seems to give me all the musical quality I want on a tape. I haven't got round to CDs, although I appreciate they do sound a bit better than that. But if it's going to cost me £600 to buy a digital set it's going to take me an awful long time to do it. Even that little television behind you, I got it second hand, an ex rental set, in order to use it with my Spectrum computer. It's sitting there, it's never been serviced or needed repair. But it's got no remote control, so a lot of people turn their noses up! John 3,1

Mike (Group 1) is similar. He can see little point in investing in new technology, which anyway is too expensive for someone who is retired. His attitude to life is one of simple pleasures, he is never in a hurry, or particularly bothered to do anything. He is does not care if he missed phone calls, and hardly has anyone to call:

> James: Do you use the telephone very much?
>
> Mike: I don't use it very much, my wife does... her friends.
>
> James: Do you have an answering machine?
>
> Mike: No, just one of the little phones that you can carry a short distance away from the house, that is all. Do you use that when you go outside when the wife is not here? Yes, when I remember, I don't always remember. If I miss one or two calls it doesn't really matter. I am retired, why bother about things like that. Someone will ring back? That is the best of living in the countryside. Mike 1,1

Several of the older people claimed they were ‘too old’ to go about learning how to use new ICTs. This is partly related to their activities, they have little reason or obligation to adopt many of the new ICTs and services on the market, and often fewer resources, but there is also a withdrawal from innovating, and the effort involved. Often they do not work in an environment where adoption and use of new ICTs is necessary. They also have time to see people, to use older, more time consuming methods of getting what they want, such as going to the library or to the bank. Only as old age progresses do ICTs become more important as mobility is reduced. The only person in the study that was approaching this age was Mike (group 1) who expected that as he was able to do less, he may consider adopting satellite television.

Mid-life pressures and family

Those such as Ruth, Fiona, Maurice, Maura and Terry aged around 40, were all in responsible jobs, and had family commitments too. At this age time is at a premium, and pressures at work were forcing the adoption and use of ICTs. When they come home, they want to get away from things associated with work. Time at home to learn how to use new ICTs is also at a premium, and not something they want to bring into their non-work time (Gournay and Mercier, 1998). This pressure was less apparent for those of similar ages but

without families, such as Andy and Trevor, who had plenty of time to learn and adopt.

Children and Teenagers

The respondents of this age in the study had entertainment and friends at the front of their minds. ICTs were for fun, and the centre of activities shared with friends and family, and thus in demand. Information technologies associated with work were not particularly important to them: Aiden and Ross were not using the Internet, despite having free access.

9.9.6 Habits and the status quo

Most people get into the habit of doing things a particular way, and even if a useful innovation comes along, these habits can be so much part of everyday routines and expectations (if is thoroughly domesticated), that it can be hard to change. The phenomenon of ‘never got round to it’ can be very important in not innovating, even for the simplest change. Ruth (Group 3) gives an example of why she still has the phone in the hallway.

> Yes, it's just very different. Uhu, yeah. It's also partly because you know the sort of thing I've still got this leftover from having had teenage kids in a past life that the phone is in the hall where it's cold and draughty and uninviting and we haven't even quite got round to moving it anywhere. I'm actually sure if I could be sitting here and he could be just watching the TV I could be using half an hour on the hand held but I just think to hell with it, don't bother. Ruth 2:1

It highlights that many people do not change, even though they know it would actually be better to do so, a sort of inertia that seems highly irrational, but reflects the way that we can put up with inconveniences because to change would not be certain to improve things at all, and would involve doing work and using time and resources that in the short term are not available. Often it takes a particular event to push us out of routines, and make us adopt.

9.10 Events

Finally, events help shape non-adoption. Earlier sections, including those on how and why people adopt illustrated a range of events that trigger adoption. Some events have the opposite effect, for instance depriving an individual of

access to equipment and service. In other cases, a particular experience helps shape personal expectations against adoption. Compared with the other contextual categories, activities, network and background, in which we see a technology being assessed or appropriated against a relatively stable set of circumstances, events are generally one off[194], often unpredictable and contingent.

Life events involve changes in circumstances and, priorities, or times when there is extra pressure or incentive to make decisions and change routines and attitudes. Events to do with experience of technology are associated with developing knowledge and attitudes to the technology. Particular events can show a technology in a bad light, or the technology can be associated with an unpleasant event. This can be enough to put people off adopting, or set them against getting involved with a technology.

People often get to try out services and technology in a limited way, and these can have an important influences on attitudes, and thus uptake or use. We can borrow other people's products, or try them in a shop or exhibition. This can be from curiosity, pressure from other people or necessity. These limited trials can delay any further interest in the product. Fiona (Group 1) brought her daughters to see an exhibition on the Internet in Edinburgh. She did not have a chance to use it, she let her daughter do it, but she was not impressed, "very slow" she thought. Later it becames important to her family, her daughters and brother-in-law use it in work and school, but she still has the image of 'interesting but slow.' Valerie her sister also went to the same exhibition, and gained a similar impression that stayed with her several years.

Amanda (Group 1) had a similar attitude, she had used the computer and the WWW with her mother and her old flatmate, but the impression she had was that there was not much interesting for her. She also got the impression that there were many things to go wrong, and if she used her flatmate's computer she was bound to lose or break things. It took the obligation for her to adopt to learn how learn use the machine at work, and a period of considerable

anxiety over losing data. Dorothy had trouble remembering PIN numbers for the bank and telephone service, so now cannot be bothered with technologies that require her to use them. Aiden had a bad experience buying the 'wrong' standard video game console.

> Well I don't know, it seems to be getting to the point where it's no worth buying anything because it's only a matter of months before it's outdated, you know. Em, I bought well I've got the PlayStation there, I bought a SEGA Saturn and about a year after they first came out it cost me £300 and I got 3 games and two controllers. Now you canny get games or anything for it anywhere and nobody will, nobody is interested in buying it. I've got all their own games for it. No. If I tried to sell it, I don't know, I'd be lucky to get £50 for probably. You know, it's such a pain, I paid £300 for it but nobody wants it now they're just not bothered with it. PlayStation is what they want. Aiden

For Aiden, this mistake cost him money and he can not get the new games any more. The experience really put him off spending money on constantly changing technologies.

A negative experience puts someone off adopting, make then give up, or just make them more cynical about new technology that appears to be great but also had downsides.

> Funnily enough, I know from Tesco this morning, they have a Tesco Card that goes through your account. I no sooner started than the whole thing broke down because the told us to keep the receipt, to bring it in next time, just the kind of stupid thing that happens. If a computer breaks down you have really had it. Fiona 1:1

Andy (Group 2) had a bad experience trying to by something on the Internet, when the goods did not arrive for months and months, making him wary of buying anything on-line.

Just as an encounter with a technology can spark off enthusiasm, or a life change can oblige someone to adopt, the opposite can occur. A bad experience can increase distrust and insecurity, or be a demonstration can make it clear that the technology is as yet irrelevant, or would take too much effort to adopt. Life changes can also take away access to technology, directly, such as leaving school or a job, or indirectly through a cut in income.

9.11 Conclusions

The examination of the case studies through the BEAN framework brought out many different reasons for people to reject or resist particular

technologies, but it is also apparent that there is seldom a single reason for non-adoption. An illustration is Dorothy, (Group 1) whom for various reasons is one of those less keen on adopting new ICTs. The following quote included at the beginning of the chapter includes several explanations for why she is not interested in the getting the Internet.

> You'd better ask him but not if I can help it. I don't see the sense. We don't have the need for it. My brother is a widower. He's financially much better off than we are. He's got a lot more time though. He does a lot of voluntary work with his computer and he's got the mentality where he can sit all day and works things out, and like Maurice, Maurice makes his work. That's his em, bread and butter. But it's not even a smear of jam to me. Dorothy 3:1

She says there is ‘not much need’, and she does not have ‘the sense’, and implies that they do not have so much money as her brother. She also implies that you need a certain ‘mentality to sit all day and work things out’, which is not something she could do. Lack of a pressing need, few resources, no experience and enthusiasm, technologies that go against personal values, coupled with lack of technology with evident benefits combine to create a general negative attitude. However this types of attitude seems to have a great deal to do with experience and knowledge, as Dorothy says “ I have an innate mistrust of them. I don’t know why but that’s ignorance, I’m quite sure.” (Interview 1)

However many people can be enthusiastic users of one technology, and not be interested in another at all. In this case non-adoption is based on specific issues to do with the activities someone is engaged in and the problems of particular technologies rather than a general mistrust or dislike. Expert and enthusiastic computer users such as Andy have specific problems with new Internet services and a big problem with mobile phones (see Chapter on Problems of Use). Seen from this angle the problem of non-adoption and non-use gets put back with the technology developers and suppliers and the technology itself. Despite incredible advances in ICT technology and its appearance in more and more situations, many products are still unsuitable for many applications and users. One in particular, the personal computer, seems to present as many problems as solutions. Embedded systems and

network based computing power where the much of the ‘technology’ is hidden still cause problems, but are perhaps much more accessible and acceptable, whether it be in a telephone or an electronic bread maker.

Chapter 10 Non-use and non-adoption experiences and strategies

10.1 Expectations, Limitations and the Enhanced Barrier Model

The title of this chapter introduces an analysis of non-adoption and non-use. Much of the non-adoption described is based on limitations in the technology, the supply system, and the resources and skills of potential users of a technology, what could be called barriers to adoption. The other main factors are negative expectations of adopting and using a technology, which could be described as resistance. These factors can be seen as combining to create socio-technical barriers to the adoption and use. The literature review discussed in depth the concepts of resistance and rejection and the constraints and barriers that shape adoption or rather non-adoption. Non-adoption could be seen as the result of different objects and strategies of resistance, such as rejection of a class of technology, or temporary postponement of adoption. In turn this could be seen as the result of internal processes such as attitude and knowledge, and external factors such as resources and some type of 'need'. One way to understand the non-adoption that appeared to be important in this study was through the *expectations* we may have of personal adoption of an innovation. We have to look at what the expectations are, and why they might lead someone to avoid or delay adoption, and the source of those expectations[195]. Looking at the longitudinal data from these cases, we also see how these expectations might change, or be 'reconstructed' over time, with changing external pressures, resources and social influence.

It is clear that even for the most adamant non-adopters, non-use and the non-adoption is not a fixed state. Many of the non-users had expectations that they would eventually have to learn to use the Internet. They see their non-adoption as a temporary respite or resistance to the day when they will not be able to avoid learning and using the technology.

Aiden (Group 4) summed it up:

> Eh, I don't know. I suppose I'll have to get interested in it sooner or later because I think it's just going to take over. Well not 'take over'! I think it's going to - everybody is going to be into it sooner or later because it just seems to be spreading. Aiden 4:1

Technological and social change appear inevitable, even if one does not want to adopt, one will eventually do so. Aiden feels it is because he has to. Valerie expects that one day computer technology will be applied for something that she needs it for. Against this expectation that they will one have to adopt the technology, why do these people appear to be putting it off now? The reasons for the delay are numerous as has been amply demonstrated. Reasons include:

1. No need of a technology to do the current activities.
2. Reported problems and limitations of products and services currently on offer.
3. Not having enough time to learn
4. A desire to avoid technical obsolescence in a time of rapid change and uncertainty.
5. Not having the resources to adopt.
6. Desire to 'keep things simple' for as long as possible'
7. A desire to make a stand, with some sort of symbolic resistance, such as not using a machine even when one has it.

Amanda gives an example of not wanting to take the risk now:

> We did and we probably should have actually because they were cheaper to install in the first place but at the end of the day we don't really want a hundred odd channels with cable. We've got their connection there, right up beside us for cable but... Sky dish... I don't know which, if it's worth getting Telewest in if it's going to be overtaken by something else so we weren't really that bothered. Amanda 1:2

These could be permanent reasons not to adopt, as some people have no expectation that they could ever need and want it, so even though socio-technical change is inevitable in general, it will always pass them by- they are able to *withdraw from change*. Those who are retired, such as Dorothy, see the technology making their old job easier or more efficient, but now it is irrelevant to them.

> Well the check outs a lot quicker than if they had to write everything down and tot it up. But the way their education is going they can't add two figures together. The marking system I can appreciate, the marketing and the stock control, and all that, I think that's marvellous. Just as at the doctor's they've got all your records and they can press a button and see right away the latest up to date if it's been programmed in. And I do think it's the way forward. I'm glad I'm not part of it but em, I'm interested enough to watch it but I don't want any part of it. Dorothy 3:1

10.2 The Enhanced Barrier Model of non-adoption

From these descriptions of different aspects of non-use, it is possible to summarise reasons for non-use and non-adoption. Instead of relying on the concept of resistance, with its rather psychological basis, it is useful to look for a description that emphasises the sociotechnical aspects of non-adoption. This description we can call the *barrier model*[196]. The adoption of the term barrier is with some reluctance; it provides a verbally convenient way of combining and summing up a range of influences surrounding the adoption process. However, this term also has unfortunate connotations for students of technology and innovation. The idea of a barrier is usually used in the context of a pro-innovation or deterministic model of technology progress, where people are expected to adopt an innovation, and something is seen as stopping them. The reasons may the related to the person, the technology or the environment. Research critical of this model of technology adoption and non-adoption should also be critical of the idea of a barrier. However, there are many paths for people to take, and only some of them involve adopting and using technologies. The choice of the word barrier does not preclude a more complex approach or imply that a decisionist or deterministic model is being used. The term barrier could convey a metaphor of physical obstacle which may not well capture the range of both practical obstacles and personal choices which are subject to an array of more or less contradictory impulses, For example, in those cases we discuss under the term *relevance* barrier, what is mainly at issue is the gap between expected value or benefit of adoption and the perceived costs and risks. *Symbolic* barriers refer to the perceived gap between the identity of the individual, and the way they read and ascribe meanings to technologies, other users and non-users and the supply industry. In other cases there is no judgement or even knowledge of an innovation: the gap or barrier is not formulated in the mind of the non-adopter, but nonetheless exists between them and the innovation and its promoters. In drafting this chapter I contemplated using the term gap, but

that also brings unhelpful and rather similar connotations. A practical or perceived gap appears as a barrier to engagement with an innovation.

In thinking about the relationship between a person or society and a technology we construct a model in which the idea of barrier is a perfectly helpful way of understanding the degrees to which someone engages with that technology. The Barrier is always 'techno-social', as it is a construct of this relationship between person and technology, neither purely dependent on the technology, or on the people who are not adopting. The barrier is also continually changing with circumstances, being reduced, redefined or reinforced.

To emphasis the complex nature of the barriers, I use the term 'enhanced barrier model'.

The Enhanced Barrier Model	
Barrier	***Some characteristics***
Resource Barriers	No access, No money, No time or space, No contact with technology
Relevance Barriers	Not relevant, No need, Not part of everyday life, Other more important ways of using resources
Symbolic and Subjective Barriers	Disapprove of technology or industry, Dislike technology, Feel uncomfortable with ICT use, Ignore technology
Knowledge Barriers	Do not know about the innovation, Do not know how to adopt, how to use, how to cope with problems or how to innovate activities.

Table 25 The Enhanced Barrier Model of Non-adoption

All of these barriers can be examined through the BEAN framework, showing for example, that someone's close social network reinforces symbolic barriers, such as disapproval of ICTs, or their education and work experience did not equip them to easily adopt new ICT innovations. Of course these 'barriers' are interdependent, a product may be viewed as irrelevant simply because it is seen as too expensive, which is a practical barrier. They are not the same, since there is no determined causal relationship between the two.

10.2.1 Knowledge Barriers

A common explanation given for non-adoption is not having the knowledge or skill to use a new technology, or expecting that it is difficult to use and manage. (Activity, Background). There is a range of different knowledge needed to adopt and use ICTs, including how to understand the marketplace and deal with suppliers, how to judge competitive products and services, how to make purchases, how to set up a system, how to learn, how to use a product, how to deal with problems, how to control the technology, and how to innovate uses and routines around the technology. Most people are aware that these are important issues, especially as the products are complex and constantly changing.

This barrier can be an *expectation* as much as a fact. The expectation is that the skill will be too difficult to acquire, because an individual is not a 'technical' sort of person, or is not patient enough. This again is built on the assumption that the technology demands a great deal of knowledge to use. This expectation is built from past experience with the technology, or similar technologies, general cultural beliefs about the complexity of technology, including the idea that is can easily go wrong, the *risk* is too high.

Ignorance

A key aspect of this attitude to new ICTs is that even though there are a great many opportunities to learn about new innovations though friends, the media, shopping etc, these are just not picked up on.

> James: Em, what do you think about them? Do you read much about the new technology and Internet or see it on the TV much? Does it come up?
>
> Dorothy: Just ignore it. Dorothy 3:1

I asked about many products that an individual could use, and also about industrial and service applications of advanced ICT that would affect them, and are common knowledge in the industry and discussed in the general press and media. While some people knew of general classes of ICTs, specific parts were often unknown. For example people knew about the Internet, but not about the various communications services on it : e-mail,

chat, bulletin boards. Many people drew a blank when it came to more industrial uses of multimedia (e.g. traffic management, financial industry, marketing, health). Advances in health technology were always seen in terms of genetic engineering rather than ICT developments.

10.2.2 Resource Barrier

Resources such as money, time and infrastructure are a key factors in adoption and resistance to technology (Dholakia, Mundorf et al., 1996a). Resources are need to adopt, and to appropriate, assimilate or integrate new technologies successfully. Money is factor in access for private use (Activities), even if someone is interested in adopting. At work, employees depend largely on their employer to provide the tools and the infrastructure (Activities, Network). Money is not the only resource needed to adopt: not all areas have telecommunications infrastructure for mobiles, or Internet connections, and very few places have infrastructure for broadband Internet access except at very high cost. Some even more basic resources are also needed, such as electricity and space, which are not necessarily available. (Activities).

Another important resource is time: Although many ICTs are aimed at saving people time, in the short run the time it takes to adopt and learn to use an innovation can make it very difficult for busy people. Time-wasting or hungry products are even less attractive to busy people. Space can be a factor, the location of television or computer in the home shapes the types of uses it can be put to, and the access by different household members.

Lack of knowledge may be a barrier to adoption, but so may the lack of resources to gain that knowledge, such as an accessible training course, an employer willing to pay for training, a support service, or an individual who can lend their expertise. Resources to maintain technology and develop uses can lead to discontinuation of use when things go wrong.

10.2.3 Relevance Barrier

The Relevance Barrier covers attitudes towards innovations, the relevance of technologies to particular activities and applications, whether there is a practical or symbolic 'need' for a technology. The technology is not seen to have either practical or meaningful significance – there is an expectation that it could not be integrated or appropriated to any effect, either into an activity or into a relationship.

Don't need this product/service: Some people are not interested in a technology even without knowing much about it, but assume they it is irrelevant to them. Some however have a good idea of what a particular product or service is, and have decided that they do not need it (Activity)

Don't want this class of product/service: A rather more general category of rejection is non-use of a technology or service because of more specific reasons about a class of technology (Background, Activity).

Don't take any interest Several people did not take any interest in the field of new ICTs. This means that they may have heard about the Internet, for example, but have never been interested in knowing more. The reasons for this were various, they expect that it will not be of any advantage to them to use (Activity), either because they are satisfied with the way they currently live and work, or because an innovation has a specific use that they have no interest it. Some expect that it will be too difficult to learn (Background), they expect they would have to expend energy and time learning they would rather use for other activities (Activities, Background). Some past experience (event, background) or stories from the media, friends and family helps create this expectation.

10.2.4 Symbolic and Subjective Barriers

Models of consumption and resistance highlighted the importance of subjective reaction to technology, and symbolic issues that relate to personal identity and the meanings associated with a technology (Csikszentmihayli and Rochberg-Halton, 1981; Silverstone, Hirsch et al., 1992; Dunphy and

Herbig, 1995; Holt, 1995; Szmigin and Foxall, 1998). For many people ICTs can have negative connotations and associations. These can be based on a negative subjective reaction to a technology, arising from lack of confidence, and a lack of control and understanding. There is also a reaction that is essentially moral, where a technology, or use of a technology appears to go against values, whether they be personal or political. We can include the negative images that may people still have of multichannel television or of mobile phones and their users (although these are changing since the time of the study). These reactions are seldom purely moral, but accompany the image that a technology is out of reach financially, that the users are fundamentally different, and that the technology seems irrelevant or unnecessary. A quote from Andy (Group 2, 1) illustrates this well:

> when I see folk with mobile 'phones I think fucking hell !

Examples of opposition to personality and occupation include mobile phones and yuppies, computers and nerd, video games and teenagers. These are in a way modern myths and stereotypes of technology and its users. One important symbolic and subjective opposition is that between home, and work, one's 'own' time and space and the time and space given over to economic activities. For many people ICTs such as telephones, screens and information technology are closely associated with their work. This leads them to bar the technology from their home space and from conversations with people outside work.

The review of negative symbolic meanings of technologies at the end of the literature chapter can be used as a source for many other examples that also emerged in the research.

10.3 Strategies and Tactics for Non-adoption and non-use

We have seen the many reasons why people do not adoption or do not use particular ICTs. However, just as we examine the adoption process to understand how people adopt, we have to do the same with non-adoption

and non-use : how do people manage to be non-adopters and non-users? Other questions that this study can give some answers to include: Do non-users avoid information, do they have to resist external pressures to adopt, do they have to make an active effort to avoid particular products, do they use alternatives?

The strategies that current non-users have towards adoption are also related to their expectation of future adoption, and whether they non-users by choice, or whether they would actually like to adopt. Most of the respondents considered that ICTs would become ever more ubiquitous and they or those around them would have to engage with them more and more. This sense of inevitability meant that most of the strategies for non-adoption were aimed at postponement or delay, until they had to adopt, or the technology had significantly improved. We could see this as merely as a temporary tactic to put off the inevitable push of industry-lead innovation (De Certeau, 1984), or an opportunity to prepare to effectively appropriate a desired technology.

Various strategies are identified in the literature, such as delaying, ignoring and refusing, as are strategies to completely avoid adoption: neglect, distancing and abandonment, when use can be avoided; and various accommodating strategies when use is unavoidable: accommodation, partnering and mastery (Mick and Fournier, 1998). (Miles and Thomas, 1996) suggest there were also various levels of resistance that could be offered, and resistance against use in particular circumstances and by particular people.

10.3.1 Delay, and Expectation of Adoption

Postponement of adoption has been identified as one of the main reactions to innovation (Dunphy and Herbig, 1995; Szmigin and Foxall, 1998) In 1997 the Motorola Survey “The British and Technology” showed that although 40% of men and 33% of women reported they had PCs at home, 62% of men and 55% of women[197] anticipated owning a computer by 2001. Comparable figures for age are in the following table:

Age	16-24	25-44	45-64	65+
PC at home	48	45	41	6
Expect to have PC at home in 4 years	82	80	50	9

Table 26 Expectations of Home PC ownership according to age 1997 Motorola Survey

This high level of expected adoption, particularly among younger people and those of working or family age is highly significant. However the concept of active and passive response to this expectation appears important (Bauer, 1995a). Some people will be delaying on purpose, so called active delayers or postponers, others just assume it is something they will have to deal with sometime in the future, but otherwise are no actively delaying adoption, who can be called passive delayers. Delayers use a number of strategies depending on the reasons for delay.

10.3.2 Active Delay

Active delayers are those who judge that either they or the technologies are not ready to adopt. Active delayers can have a positive attitude to adopting, but think the technology is not right, or they need to learn the skills, or save money, so hold back until there is an improvement. They may be continually trialling new systems, and keeping themselves informed of developments, or preparing in other ways to adopt. They use the strategies of the adopter, and also use their network and other resources to access the technology. An example could be Andy (Group 2) who wanted a telephone and a new computer, but could not afford them, and was also uncertain about upgrading as technology was changing so fast.

An Active Delayer can also have a negative attitude, actively resisting the technology, but acknowledging that they will eventually adopt. They can use the strategies of the Rejector. The Active Delayer can also be trying to avoid negative aspects of owning or being a permanent user, such as costs or responsibility, so be using the technology though the network or in other temporary ways. Ruth (Group 3) could be termed an Active Delayer, using her husband to put off the time she would have to master the skills of the computer herself.

10.3.3 Passive Delay

A Passive Delayer is not concerned about the technology, despite fully expecting to adopt it one day. The Passive Delayer with a positive attitude acknowledges that they could benefit from the technology, but have just not got round to adopting, putting it off to a more convenient or pressing time. Valerie and Amanda both delayed adopting home banking in this way. Many of those not interested in the technology, are simply able to ignore it, maybe hoping it will go away, such as Amanda and use of computers.

	Active delayer	**Passive Delayer**
Positive Attitude	Unsatisfied with technology, or does not currently have the resources *Frustrated by Delay*	Thinks the technology is a good idea, but not sufficiently in need of the service or technology to go through the adoption process. Not bothered
Negative Attitude	Resists adoption of the technology by active strategies of avoidance and substitution *Frustrated by pressures*	At interested in the technology, and able to avoid adoption by ignoring it. *Not bothered*.

Table 27 Adoption delaying and the delayers

Delay strategies include the range of strategies and behaviours that are also used by those who never expect or intend to, especially the use of the social network

Despite using the term ‘delayer’, characterising an individual and their relationship to technology, it is important to recognise this is only a temporary identity, an event can completely change the strategy that someone uses, and for different technologies and in different parts of their life space an individual may use completely different strategies. Of course a ‘delayer’ becomes a user when they eventually adopt. Following every individual adoption process will always reveal a delay between the first development of a product and the individual adopting it, and much of the delay will not be the result of a strategy by the individual. Delay is in fact the normal process, it is a far more unusual strategy to be an active and early adopter, but that is an issue for a different study.

10.3.4 Avoidance: Ignoring Information and Contact

Many people exhibit some sort of cognitive resistance to particular innovations and ICTs, where they avoid or just do not notice them. In instances where someone finds a particular subject uninteresting or intimidating it is relatively easy to avoid engaging with it as one goes about everyday activities. While at work one may be obliged to learn and adopt, in one's own time, one can generally live happily without many ICTs at home. In the media, and in many places outside the home there are many instances of new ICTs being installed, used, demonstrated and advertised. For someone engaged with this technological change it seems impossible not to notice this, but several of the respondents hardly notice it, avoid places where they might come into contact with ICTs, avoid media reports on them, or just fail to take notice. The following examples illustrate how easy it is not just not notice innovations, or block them out:

> James: Have you noticed any, for example, in the shops, any more information technology or anything like that?
>
> Mary: No. Because I wouldn't look at that. I would never have looked at it, and I still don't look at it. I would avoid it like the plague. I don't go into shops that sell anything like that. [Mary 3:1]
>
> ----- ---- ----
>
> James: Ever heard about the free Internet services?
>
> Aiden:Hmm, I've heard of it but I dinnae really pay much attention to it. [Aiden 4,1]
>
> ----- ---- ----
>
> James: Have you heard about the new television, the digital television
>
> Helen: The disk ones,
>
> James: No, digital
>
> Helen: No, What is it?
>
> James: You haven't seen anything in the paper,
>
> Helen: No [Helen 1:1]

Even in conversations it is possible just to switch off. When friends or colleagues start talking about the technology, some people just switch off, walk away, or try to change the subject:

> I've got the odd, a few friends who do have a computer but... his friends but - and my friend Jonathan who's a doctor, he's always can be found in his wee hole on his computer. You know, and he does, I mean if him and Ewan get together you know, just

> talk about the latest game or whatever. And we just kind of sit looking blank. I mean it doesn't interest me. I'll look at something for like five minute and think oh that looks really good, then not interested in it. Amanda 2

There are degrees of activity in this strategy, some people just do not notice things, or involuntarily switch off, while other make a conscious decision not to read or see things they are not interested in. Those who are making a conscious effort to avoid information are to a certain degree Rejecters.

10.3.5 Active resistance : The Rejecter

The person who actively resists the adoption, use or particular use of a technology could be called a Rejecter. The principal reasons for rejection are value-based disapproval, or a fear or anxiety related to the technology. Today ICTs do not provoke much active resistance except in certain cases[198] Active resistance implies that there is a pressure to adopt or accept a technology that an individual is unwilling to accept. In this research there were a few instances of active resistance. In Group 1, Mike liked to watch sport on the television and was upset that some had moved to satellite TV, but he was not willing to subscribe on principle. In a case such as this the rejecter is suffering privation by refusing to adopt (all be it a minor one in this case). The other type of active resistance in these cases was parents resisting the demands and desires of their children. Fiona (Group 1) controlled her daughter's use of the TV, and refused to buy her a video games console. Maurice and Ruth (Group 3) controlled their children's television viewing.

There were two particular strategies for being an active resistor of technology, which did not entirely mean being a non-users, but rather a *restrictive* user (Miles and Thomas, 1996).

Limiting use through mastery: this strategy was to keep the technology in its place, both practically and symbolically. It normally involved the imposition of boundaries for use, such as only for work, or only for certain tasks. There is also the refusal to spend more money on it, or to learn new skills.

Using the local economy: The research showed one strategy that has not been noticed by other researchers was to rely on other people, and make use of technologies by proxy. This strategy passes responsibility, problems and costs onto other people. In many situations this was as part of an exchange in the informal economy, or part of mutually supportive close relationships. The use of this strategy is very important, because it means that the benefits of technologies are reaching many more people than it might be apparent from the statistics. Of course in the case of some technologies, there is a whole range of commercial provision of service, and in the workplace a division of labour. However with many new mass market technologies this is only slowly happening. In the case of private technology like the mobile phone, the borrowing or reliance on others is always a private relationship.

10.3.6 The Focus of Resistance

The focus of resistance is not always the artefact itself, (Bauer, 1995a; Miles and Thomas, 1996), but the way or place it is used, and its source or the system of which it is a part. For each individual the technology was only one part of a web of interconnected meanings. Resistance is often towards particular uses, towards those who control it and to its unwanted intrusion. Resistance strategies can be aimed at various ends:

Resistance to oneself using it. Some people accepted that computers or mobile phones were very useful for other people, but did not want to have anything to do with it themselves. They thus ignore, delay or reject their own use.

Resistance to particular deployment/use: Value judgements were made about appropriate use, such as computers for work, but not for play. They then control their own use, or the use of others they have some power over, either imposed or negotiated.

Resistance to particular others using: When other people use a technology it is only in certain circumstances that is possible to do something about it, such as a parent imposing rule of use, or banning use.

Resistance to development and diffusion in general: In this case resistance has to take the form as political action. However not using the technology oneself in any way as a person stand can be felt to be a small resistance against general use of the technology.

These resistance strategies are based on particular values and boundaries that people wish to maintain, or recognise as being important to their own self identity.

10.4 Life as a Non-User

In the final part of this chapter it is interesting to bring together briefly some of the observations on how the respondents coped with being non-adopters and non-users of rapidly evolving and diffusing technologies. Did they find themselves under pressure to adopt, feel upset or annoyed by technology innovation, or find difficulties in relationships and activities from not being interested or knowledgeable about ICTs? From the evidence so far, this is certainly the case, but often non-use and non-adoption was seen as a way of preserving some sanity, independence, control in life. (This is surprising, since many new ICT are developed and adopted because they can be used for these things)

There are a number of negative aspects to being a non-user including social exclusion, and exclusion of economy activities, feelings of inadequacy, conflict with users, and frustration with all these issues These may not actually make someone want to adopt, although there are plenty of non-users who are frustrated by their position. Positive aspects include feeling in control but not using technology and feeling free and independent without technology,

Compared to the problems faced by using ICTs, it is very easy to be in sympathy with those who are not obliged to or who chose not to use ICTs in their everyday lives.

Exclusion from relationships: There are several examples of people feeling excluded: This exclusion from conversations and relationships.

Exclusion from the future: Feeling of being left out and left behind of technical progress.

Feelings of inadequacy : Related to feeling of being 'left behind' are those of inadequacy. Several people expressed feelings of inadequacy about their knowledge or attitude to new ICTs. These included feeling stupid, feeling though ought to know, or make more effort etc. Some people related this to their age, but other did not.

Conflict Non-users came into conflict with users on occasion. This includes conflict over spending, over time use and over activities.

Frustration: These other problems can give rise to frustration. This can be aimed at the technology, at oneself or at the industry that promotes it or at specific other people.

 However there are some positive things about being a non-user or limiting user too.

Control: Not have to be reliant on machines, or tied down. Being able to control communications and calls on time and money that others are submitting to.

Independence: from technology and the systems that the technology depends on. It can be a binding responsibility to deal with technology

Pride: Some people are proud in their resistance to technology and being about to maintain certain values that they feel technology undermines.

Being a non-user, or limiting use is a choice made by many in the population for a range of technologies. It is not a question of access to technology. Eventually most of the population will have access and make occasional use. However with new ICTs as with any other established technology, from television and radio, to public transport, just having it there and knowing a how to use it is not the end of the story. During the course of our lives there are moments when particular technologies become important, and are used, but at other times we try to control and limit use. Even technologies that we come to depend on may only be there as a back up or safety net, what could be called *crisis access*. We want technologies to be there when we need

them, but would prefer to be able to put them in the cupboard and walk away if they start to overwhelm us.

Chapter 11 Conclusions

11.1 Introduction

This research looked at how people encounter and cope with new ICTs in the context of their activities and social network, existing use of ICTs and their background. The research data has be related in three ways:

1. An analysis of the processes of appropriation of new ICTs, including encounters, assessing, adopting, avoiding, and using them.
2. A description of what it is like to adopt, use or not to adopt,
3. An analysis of the strategies of appropriation and coping with innovations in ICTs, covering the range of behaviours between involving avoidance, control, adoption and exploitation.

The huge amount of empirical data generated meant that only some dimensions of the original research design could be followed up, so many interesting aspects were inevitably left uncovered.

Common themes that emerge in the final analysis include the importance of the social network, the informal economy and the local expert in coping with the new ICTs which we adopt. The analysis highlights the complex process of appropriation and resistance to these products, showing how they go beyond simple models of the decision-making/adoption process (such as the widespread ‘technocratic’ models which see such choice as involving scrutiny of the most appropriate technologies and a rational assessment of their costs and benefits). It also emphasises the way that experience in different areas of everyday life is important in the appropriation process, with traditional boundaries being crossed in the adoption and use of these technologies.

I return briefly to the original motivations of the research. The inspirations were studies of the domestic use of ICTs, especially media technologies, and the huge development of new converging ICT products entering all aspects

of society, the economy and everyday life. I wanted to see how individuals in their everyday life, including all their activities and in the context of their social networks across the various domains or spheres of life, would come in contact with these new technologies, make sense of them, and maybe appropriate them. This study was intended to be something of an antidote to the currently prevalent predictions and promises of industry. Unlike many other studies, I designed this to address what I (along with other writers from various backgrounds) had seen as limitations of existing work.

First, the study was to be longitudinal, following the unfolding process of engagement with a raft of ICTs as they were developed and encountered in a natural setting. Second it was not to be focused on a particular technology, since it was not possible to tell in advance which of these artefacts would be either adopted locally, or become widely diffused. Third, it was not based on those who chose to adopt particular technologies at a particular time. This research design represented an attempt to make the study more naturalistic, drawn from the experiences of the respondents in their everyday life, including those who did not adopt as well as those who did. I proposed that with such ubiquitous uptake of ICTs everyone would be affected somehow, and be actively engaging with the technology whether they adopted it or not.

11.2 Technology and New Media enter Everyday Discourse

The study showed that new technology, as it was coming into everyday use, became part of a broader culture. It became a topic of conversation, a common issue that is discussed among friends, colleagues, family, acquaintances. Many normal everyday activities, such as work, children, privacy, holidays, getting a job, study now involve ICTs, whether in adopting them, using them or making decisions related to ICTs. This brings accompanying problems, pleasures, efficiencies, excitements, financial issues, skill building and contact with new people around the adoption use and ownership of technology. These are the topics that make up our concerns; that we share with others. It is the talk about technology that really

brings it into everyday life. Moreover, since discourse respects boundaries less than physical goods, it enables technology to cross boundaries. It is also in talk that we build knowledge, form meanings, and develop expectations and attitudes towards these technologies.

However, my study showed that the major established discourses surrounding the information society were not generally in people's minds at all. Other technological changes, such as genetics, were much more of concern. However specific events would bring up information society issues, such as whether technology was good for you, for children, issues of problems of pornography on the Net, the effects of television, radiation, RSI, job opportunities and so on.

Talk about technology can become an important part of the relationship between people. Like topics such as sport, for those for whom it is relevant and interesting, it is a welcome topic of conversation and debate. It can open common ground, and provide an endless topic of conversations, able to turn towards and touch on many different aspects of life, personal or abstract. However, this talk may exclude those who are not interested, such as the people who 'turn off' when their friends or family start talking about computers etc. This can create barriers between friends and family. It can also lead to creation of local conventions about when it is acceptable to talk about technology, when is it not. However when non-users do need the information and opinion they can draw upon this discourse as a resource if they want to make a decision, form an opinion or take part in a conversation about the technology. The knowledge is not locked away inaccessible to the 'lay' person, in specialist publications accessible only to the initiated, but is circulating in the community.

11.3 'Unravelling the social network'

Social network studies of diffusion of innovation have examined the role of interpersonal influence as a factor in shaping attitudes and exchanging information. The simplest research looks at the number of connections

someone has in a community, as a measure of their access to information and ideas, and possible influence in the community. More elaborate methods look at what this relationship involves, such as how ‘strong’ a relationship is, an individual’s relationships to opinion leaders, and relationships with others outside the local community. However, in general, there is little research on the details of how these relationships actually work, how they are lived, and in what situations and under what conditions they appear to have the ‘effect’ that they do. An important part of this study has been to try and unpack this social processes of the network. This is the type of work done by ethnographic research, informed by the social network approach.

A structural approach to social network analysis tries to establish the general working of relationships and networks, which are presumed to endure over time, and provide the context for the adoption of a variety of innovations. Extending this to a longitudinal study allowed me to examine how these relationships change over time, as new innovations are incorporated into everyday life and the relationships between individuals in a community change, and with broader changes in the context and environment. An additional way to study change is to look at particular life events, how they have influenced or involved the adoption or use of ICT innovations, and then to try and understand the importance of contingent events and relationships as well as the structural effects. My initial endeavour was to understand the social context of respondents in four loosely defined networks, and attempt to compare and contrast them, both internally, and between groups. Then I looked at the way that new technologies come into the communities around these people, in order to understand the processes by which they were appropriated or rejected. Subsequently I tried to understand the effects on the network of appropriation – whether there were structural changes, or the technologies reinforced existing relationship and structures. In fact, while my study raised some interesting developments in how people communicated and organised themselves through the medium of new ICTs, the most

evident issues were around the networks of knowledge and expertise related to ICT adoption and use.

11.3.1 Studies of Social Networks

The methodology used the idea of following social networks to find a group of respondents whose lives touched each others. This provided a way of studying the exchange of knowledge and personal influence in the adoption and use of ICTs. Central to this idea is the ability to extend the range of social networks beyond those that are generally studied in technology or media studies, the firm, the family, the club etc, to look at the role of informal networks and associations that cut across the boundaries of these organisations to reflect the position of the individual as a member of a number of communities and the centre of their own social network. A lengthy literature search uncovered a number of research domains that have developed around the concept of the social network. These include quantitative micro-sociology, and studies of the diffusion of innovations. However many social network studies are based around looking at either a professional or a family network, and not a crossover between networks. There are some exceptions, for example, some social network studies look at primitive societies where life is organised in very different ways. Others look at communities where there is a strong social and professional crossover (such as farming communities). However, in most industrialised societies an individual is a member of multiple communities that may or may not overlap. Each individual is the central node in their personal social network. Some researchers have a theoretical perspective that an individual has ‘multiple’ identities based on their membership of different networks, and the different cultural norms and values associated with each network. The individual has to work to live with these multiple identities and to reconcile them. My approach assumes the opposite, we have one personal identity across domains of life, which we expressed differently according to specific context (Goffman, 1959; Douglas, 1996). We have boundaries that separate different activities such as family life, professional life, community life that we have to

manage, using various tools to try and reinforce or break them down according to circumstances and the desire to integrate or separate domains. One of the achievements of this study has been to extend and elaborate social network analysis to include the multiplicity of informal networks and associations that make up the fabric of everyday life.

11.3.2 The Life Space

The first aim of this research was to try and see how these domains of social activity were linked, and to look for networks that cut across the boundaries of everyday life domains or arenas, such as those that we traditionally see between home and work. I also looked for other arenas, outside the home or work, including entertainment spaces, and social arenas such as friendship networks, local community, etc. The research showed very clearly how the respondents were able to link these domains or arenas in their discourses, and the clear integration of their networks and activities in everyday life. Although there are many differences in activities, place, types of relationship, organisational and tacit rules of behaviour in different arenas such as the home or work[199], the individual is still the same, and carries ideas, and often activities and relationships across boundaries between arenas. In diagrammatic form I looked for the common everyday arena or domain as one space, rather than as several spheres with strict boundaries (Figure 7). These boundaries are being constantly renegotiated, broken down and reinforced. The adoption and non-adoption of ICTs is intimately tied up with this process.

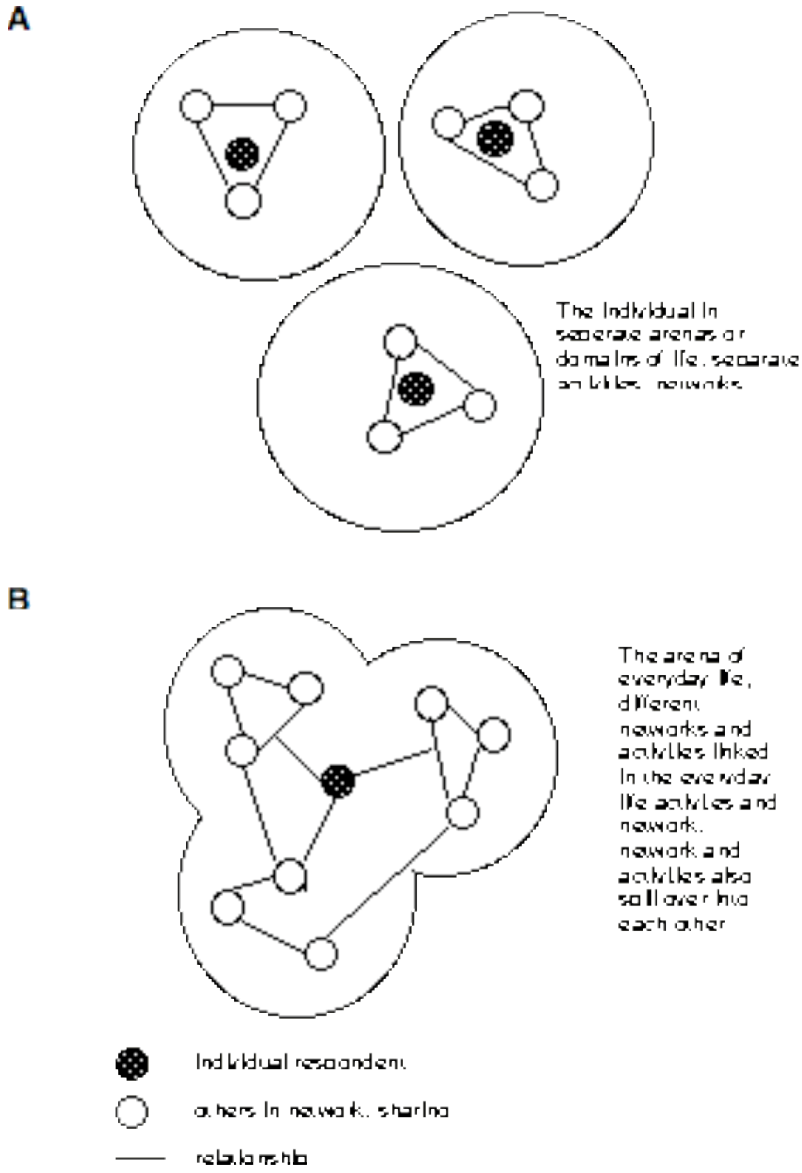


Figure 7 The life-space: The arenas of everyday life

Bringing these together I will use the term used by Dholakia *et al.* the 'life-space', to describe all these activities and relationships (Dholakia *et al*.1996). I suggest that 'life-space' should be used to capture this coming together of domains of everyday life, and be used to make sure analysis does not get entangled with the idea of the everyday as the home.

11.3.3 Networks and Communities

Every individual is a member of a number of networks, with varying ties. She or he may have a range of relationships with each sub-network, involving people who maybe very different to them. Every individual acts as a bridge between different sub-networks. Certainly some people have sub-networks that are more integrated than those of others, i.e. their colleagues are also their friends, or they work with their family. In these networks complete separation of home and work relationships certainly was not the case, although there may have been attempts to draw boundaries, for example through an effort not to talk about work outside working hours. In general the subgroups are homophilious in certain dimensions, such as groups of old friends, or colleagues in the same office, but in other dimensions the members are very different. Family members share a home, but vary enormously in other respects, such as values, tasks, expectations, life stage, control in the network etc. This is also true for the workplace. The members of any subgroup are linked to many others through the other activities in their broader everyday arena. The idea of homophily is useful, as we see that people with similar interests and life conditions can compare and share ideas and goods on an equal level, but the fact that there are many differences between people in a subgroup is also very important for bring in innovations.

It is these differences that give rise to many of the disagreements and conflicts over the use of technology within the home. These differences would be ‘fatal’ to technology adoption if the home were not an extremely leaky vessel, with every member being part of social networks that crossed the boundary to other domains of life. The interests, requirements and support employers, the workplace, friends, other family members make the presence of the technology in the home sustainable, both practically and symbolically, and can only be understood in terms of networks crossing the home boundary.

11.4 Boundary Crossing

The research showed that although some subjects and activities are kept within boundaries, new ICTs are crossing them, with values, ideas, experiences and technology crossing from one arena to another. The main boundary was between two areas where technologies are most used, home and work. By focusing on boundaries a number of points become clear:

Experience in one domain of life with ICTs is carried over to other areas of life in practical and symbolic ways. In the study there was frequent crossing of boundaries, including similar technologies being used at home and work, and with ideas, advice, and learning being developed and used in both areas. People with computer experience at home were better able to cope with enforced adoption at work, and those with professional use of computers were able to bring computers in the home, and help others in their friends and family network to do the same.

People use ICTs to make and maintain barriers, as many technologies are linked symbolically to work. Some people identified ICTs, particularly the telephone and the computer, closely with work, and where they refused to bring work home they also actively resisted using the technology at home[200].

There were other common crossovers where ICTs were relevant, such as between households, within households, between networks of friends and colleagues. The community was alive and well, and inter household boundaries were crossed by ICT use. These were investigated through the concept of the informal economy.

11.5 Informal Economy

The study also showed that there is an *informal economy* of ICTs. The informal economy passes goods and ideas around, but is also the site of a great deal of sharing and two-way interactions. The informal economy was shown to be very important in the adoption and use of ICTs. The informal economy can be seen as a social network exchanging and sharing goods, passing information by word of mouth and by demonstration, a place where

people learn from each other and together, as a site for personal influence, and for the negotiation of values and appropriate attitudes. This reflects the concept of 'moral economy'(Silverstone, Hirsch et al., 1992), which is not only an economy of exchange and consensus building, but one of conflict, ambivalence and opposition. The moral economy can be seen to exist not only in the home, but crossing over traditional barriers. Each person develops their own attitudes and use of ICTs, with cues from all their networks.

Far from being an individually consumed commodity, the everyday experience of ICTs, consumer electronics and electronic media, especially computers, is that of an informal exchange and sharing of artefacts, information, and knowledge. In the study many people borrow, lend, share, give and receive as gifts, inherit, marry into and pass on and sell hardware and software. They also exchange advice, expertise, and help each other with maintenance, repairs and set-ups.

Computers have been an important part of many people's lives for many years, and many people have had the chance to build up expertise through professional use, and personal interest. There are also many people, particularly the more technically literate, who may be upgrading their computers, and selling on or giving away the machines and software. Other consumer electronics items are even more common, and the software and hardware is exchanged as gifts, lent, borrowed and shared among groups of friends and colleagues.

Models of diffusion and adoption of technologies and innovations almost all assume that adoption it is an individual act in a particular social context. The network or significant others – peer groups, reference groups etc. - are there to provide information and influence attitudes and adoption of discrete innovations. However there are several dynamic processes in innovation and adoption, and there is a continual process of support and exchange in use and adoption of a cluster of related products. These products include consumable media products as well as platforms to use them on. Individual

products are not so important as series of linked products that are reinvented over generations as they are upgraded and abandoned. There are many products that do not need to be personally owned to be used, or for people to be affect by their presence. Sometime people are able to use products they do not own or have direct access to by borrowing, or proxy use, but get others to use them for them.

Examples include:

- Gift giving: computers to children, CD player
- Borrowing: games, TV and video, CDs, computer
- Using someone else's: computer, games, Internet connection
- Sharing: computer between partners,
- Inheriting – husband's computer/video/TV in marriage
- Pass on – buying computer and parts from another member of family, friends, colleagues
- Proxy use – use of Internet, video programming, Web Site building, word processing, sending e-mail
- Skills – helping build a computer, install software, fix bugs, wire to the Internet

Many examples from this research have shown how people share responsibility for activities and work – in the workplace there is a formal division of labour, but there is also an informal division too. In the home there is often an agreed division of labour too, even if can be contentious. In theory, the workplace division of labour is based on productivity, and the skills and machinery deployed by different people. In the home this can also be a factor. Often tasks are undertaken by particular individual for traditional rather than productive reasons. Some people try to get out of responsibility for particular work, such as by breaking plates to avoid washing up, or by pretending ignorance, The opposite is true for things one like to do because they are fun, interesting, rewarding in some way. ICTs come in to many tasks, and can play a role in the sharing of responsibility. For example:

One person takes responsibility because:

- they have skills
- they want to do it – it interests them.

- no-one else wants to do it.
- it is unattractive task to others.
- they do it out of habit.
- there is division of labour based on time, or necessity.

Sharing of responsibility, or handing it over forcibly can also cause problems with regard to for those who do not do it:

- they do not learn skills.
- They do not learn about the product and market.
- They do not make social contacts connected with using the technology.
- This can lead to disadvantage and exclusion.

11.6 Local Experts

The informal economy does not only affect the home, extended family and community, but is a basic part of the work place, and crosses between these arenas. A particularly important aspect of the informal economy is the *local expert*.

The literature used in this research identifies a range of roles for individuals within a community or network that are central to development, adoption, diffusion and use of innovation. The management literature identifies the product champion in an organisation, social psychologists and consumer researcher identify opinion leaders, technology studies show the role of intermediaries and constituency builders etc. There are many roles that such individuals can play, such as promoter, broker, gatekeeper, etc (see Appendix). I demonstrated the importance of informal local experts in ICTs who could be called upon by others in the network when they wanted information to form opinions, to make decisions, to get hold of products to help the learning process, and to deal with the everyday problems caused by ICTs. These people are only relatively more expert than those who consult them, and they only become experts when those in their network encounter and have to deal with new ICTs. Like opinion leaders, they are approached because they are already in the network, and they have an informal, friendly

relationships, and with someone who know as much about the person as about the technology. Unlike opinion leaders, local experts have an on-going role in the support of other technology users. If fact their role is much more varied and important. They provide easy access to expertise, reducing the uncertainty and insecurity many feel using ICTs, especially when they go wrong. In this stage of the relationship, the local expert will also play the role of the intermediary in the two stage influence model – making their experience, and information from the specialised media available to others who may have less time and resource to engage with it. However they also help people to make their own interpretations and use other sources themselves.

Local experts tend to be people who move expertise across their life-space, such as from work to home, where the knowledge and experience has not previously been relevant. Many will have had to develop the expertise themselves by hands-on learning-by-doing, formal training, or use of the media etc, in relative isolation. Often they will seek to join or create other networks where they can share their expertise and consult their own 'local expert'.

11.7 Technical and Symbolic Convergence

The concept of convergence applied to multimedia ICTs is based on digital technology making previously disparate products more and more similar, with computers becoming entertainment devices, televisions becoming information devices, data integrating with video and sound and so on. Convergence in multimedia is also meant to be a coming together of industries and regulatory regimes. While these are happening to a certain extent practically, one aim of the study was to see if there was some sort of symbolic convergence between a range of ICTs that people encounter in their everyday life, whether new ICTs were linked symbolically as part of a cluster despite very different applications and appearances.

Of course this depends on ICTs having some sort of meaning not associated with their basic use and function. This was certainly the case for computers, mobile phones the Internet and other 'gadgets'. For all the respondents these technologies had some sort of strong meaning, either to do with engagement, control and freedom, or alternatively to do with loss of control, intrusions, submission and anti-nature, anti-human values. Basic values were reflected in the meanings given to technologies and the way they were appropriated. Did people make a link, say between mobile phone, the Internet, a Global Positioning System? Yes. This link also affected their attitude towards ICTs and the way they appropriated them, such as using strategies of limiting use, delay in adoption, and tight control over the domains of life and relationships they could intrude into. Technologies were linked with respect to a global negative image of the place of technologies in society, and their propensity to bring problems with them. All the products created similar problems: technical, usage, in relationships, dealing with suppliers, of self-image and uncertainty over future. These respondents contrasted with a few enthusiasts who sought to experiment with every new technology, expecting to find some sort of benefit and new freedom. The link between the personalities and activities of enthusiasts and new technology as also an important factor for many non-users or reluctant users.

11.8 Complexity, Uncertainty and Difficulties with New ICTs

One unifying factor that many people saw as linking ICTs were the difficulties they caused. The research demonstrated that although those who use new ICTs find them extremely beneficial and useful, they also find many problems. The technologies mentioned in the study are still not stable and are often flawed. Even those with considerable expertise often experience difficulties setting-up and keeping them operating. Those who are trying to adopt for the first time, or to upgrade, have to deal with the considerable uncertainty, complexity and difficulties involved in making sense of the many different technologies available, the lack of any clear choices, and the often

huge amount of knowledge that is needed to even approach them, let alone use them. This knowledge is often not formal and explicit either, but comes in an important part from using the technologies. Without access to knowledge capital and routines, acquired over years of use there are a great many hurdles. To cope with, this people turn to the media and formal resources, and, critically, to the informal economy and the local expert. However, as has been shown the social network and the institutions that frame everyday activities, such as work, shopping, and family life are often the cause of problems too, and the these can only be resolved though social innovation.

11.9 Adoption and Appropriation

Whereas most consumer research tends to see the adoption of a new product as the result of a decision made by an individual, albeit influenced by peers and social groups, this study shows that in many cases new technologies are imposed to a less or greater degree. This means the adoption process is bypassed from the point of view of the end user. Adoption is thus concentrated in the implementation stage. Once obliged to adopt a technology everyone has to attempt to appropriate it as best they can, developing and implementing coping strategies. Appropriation involves developing routines, practical skills and a way of reconciling or coping with the ambivalent meanings of the technology. Examples of enforced adoption include work place computerisation, gifts, entering education, or setting up a business. These are circumstances it is nearly impossible to avoid. To cope, people often turn to the informal economy to support their strategies.

We must contrast this experience with the many cases where there is no actual adoption of particular products, but there is still an appropriation process occurring. On the one hand most forms of resistance involve ‘work’ in symbolic terms, such as classifying the product as irrelevant or bad, and in practical avoidance. On the other, with so many new products emerging, and a vast array of ideas about how society and the economy could be affected, I found that there is a long process of coming-to-terms with technical change,

and working out not just whether to adopt single products, but how to cope with what appears to be inevitable change and the appearance of a constellation of ever more compelling ICT products. Appropriation of new ICTs is sociotechnical in nature; dealing with other people adopting technologies, dealing with changes in the workplace, the knowledge and needs of children and significant others, as well as facing the technology itself.

11.10 Events and Triggers to Adoption

Many studies of adoption or domestication take an event, particularly the announcement or adoption of a new technology as the starting point for the research. This is because the introduction of a technology creates change, and enables the investigation of the relationships and attitudes of everyday life. Everyday life is often taken as the routine and banal context into which this technical object arrives. However, I suggested and found that different kinds of events are extremely important in the appropriation process, be they major life events or annual events. These would not usually be thought of as 'everyday', but in the 'everyday' they dominate thinking, planning, and engagement with people and technology. It is also hard to keep events in one domain of life. Instead major events will have an affect across all domains. Changing job, getting married, retiring are all profound changes that have long term influences as their implications are appropriated, taking the opportunities or coping with the difficulties.

In terms of the adoption of technologies, life events and cyclical events such as Christmas or holidays were very important to the otherwise gradual appropriation processes. Adoption of new technologies was often the result of some other change. In many cases this was a change in occupation, such as becoming unemployed, the introduction of new organisation etc. Accompanying this change was a need to change attitudes and use of technology. Even those who were not obliged to adopt generally had their decision triggered by a particular event. This trigger often turned their attitude

from resistance to adoption, rather than from indifference or ignorance to adoption. Examples include needing to upgrade a computer, but holding out as long as possible until something happened to make it possible or make it necessary, or the case of the friend moving to Africa, a huge phone bill breaking resistance to using e-mail.

11.10.1 The BEAN Analysis Structure

Another, methodological achievement of this study is the BEAN approach which provides a practical tool for investigating the appropriation and adoption of ICTs in everyday life and across the life-space.

The BEAN approach enables the management of large amounts of data, and structured investigation of the domestication and consumption process. It does this by focusing investigation on four dimensions of everyday life: Background or personal history, Events, Activities and the social Network. Within each dimension, material, social and symbolic aspects of everyday life are brought together.

Background focuses on an individual or community's life history, previous life stages, values, experiences of technology and socio-technical change. It shows how past experiences can be brought to bear on engagement with innovations, including the develop of knowledge capital.

Activities covers current life projects, such as family, employment, current goals and motivations, and specific routine activities of everyday life. It looks at resources currently available, such as money, space, time and skills. New technologies have to be relevant to existing activities, transforming or supporting them, although sometimes they are used to develop new activities.

Events are specific activities that produce changes in routines or life projects. These are often times when new roles are taken on, activities change and new technologies are adopted. Major life events include changing job, having a family, unemployment etc. Some cyclical events such as holidays and Christmas are important times for the adoption and use of new ICTs. The

focus on events is not common in research on the adoption and domestication of technologies, but provides a rich vein of interesting material.

The Social Network is all the relationships with other people, across the whole life space. The social network is the site of the social consumption of technologies and their meanings. It looks at how the network is used for information seeking, providing resources, problem solving, and support, but also how it is the source of conflict and compromise over the adoption and use of new ICTs.

All dimensions of BEAN bring us into contact with new ICTs, and influence the adoption process and domestication processes. It was used in this study in a flexible way, to guide the codification and organisation of the data and its analysis. To the extent that this thesis is concerned to address the ways in which ICTs are becoming integrated within the fabric of social life, the BEAN approach provides tools for examining the different dimensions and their inter-relationship – the warp and weft of the techno-social space.

11.11 Non-adoption, Non-use and Resistance to Technology

These are dimensions of technology adoption and use that have not been adequately dealt with under existing research, which until recently has deliberately or unconsciously failed to treat adoption and non-adoption symmetrically – not only in the explicit pro-innovation approach, but also implicitly through methodology which starts with a particular innovation and addressing incentives and barriers to its adoption. This research specifically set out to treat adoption and non-adoption symmetrically, addressing it in an open way. This is especially important when there are a huge number of innovations, most of which are only adopted in a small number of configurations, or completely fail. Non-adoption is not the mirror of adoption, there are many reasons and ways of not adopting.

We see that people do not adopt for a variety of reasons. These include ignorance of the innovation, making a rational decision that a technology is not suitable, through lack of resources, and according to value based generic

meaning given to technologies. This study made very clear that many people did not want to adopt new ICTs because they were not seen as relevant to their everyday activities and interests. At present many information and communication technologies does not actually provide people with a relevant or useful service, so there is little interest in using them.

However in some situations, especially at work, there is often considerable pressure to adopt, either directly, or because of a sense that technical change adoption is inevitable. There is a strong sense of the inevitability of technical change. However there is also a strong desire to resist this, making a small, personal stand. This manifests itself in strategies of deferral, avoidance and active resistance.

In many cases adoption is unavoidable or a few practical benefits outweigh the resistance to not adopting at all. There were a number of reactions to being made to adopt, some very positive, such as delight at discovering a new tool and unexpected benefits, but often problems and desire to resist remain, creating a sense of ambivalence. In this case strategies are need to limit and control the technology, to master it on the term of the user, rather than give in to all the possible uses. The social network is very important in implementing some of these strategies: they are social in nature, and their development is a basic part of the domestication process.

11.12 Domestication: Taming or Caging?

Domestication is used by several writers to imply the ‘taming’ (e.g. (Lie and Sorensen, 1997a)) of alien commodities from the industrial world, where the owner appropriates them and they become ‘inalienable’, “invested with particular in-separable connotations” (Miller, 1995), when they leave the formal and enter the moral economy (Silverstone, Hirsch et al., 1992, p. 127). However Silverstone and others recognise that some alien meanings remain, the product can never be completely ‘domesticated’. I observed in the case study that many people failed to really domesticate these technologies. They instead had to keep them in caged in the back yard, only letting them out on

certain occasions, never really trusting them. They arrive at an unhappy compromise, and would be very pleased to get rid of them. Studies of households, gender and generations show that these tensions are often caused by different members of a household interpreting the technology differently, causing conflict. In my cases where there is considerable cross-over of home and work, the tension comes from the obligations of home and work. In these cases the cause of the tension is largely social – or interpersonal. However, the technology is not neutral, and can be the cause of the tension too. For example, the lack of confidence and the problems of ownership and maintenance can contradict the benefits derived from the use of the technology, or its ownership. In other cases there is a tension between what the technology represents - a reliance on technology, or being tied into a techno-industrial system, or an anti-nature programme that goes against basic values.

As the previous section concluded, the general reaction to technology is ambivalence: contradictory emotions over the same technology. Domestication includes the development of coping strategies that will contain the technology, reconciling these emotions. However these strategies do not imply a stable situation, since ambivalence continues. Someone with a negative attitude towards technology may distance themselves from the product, or create strict rules about how it can be used, while still having to use it. An enthusiast may choose continual replacement or tinkering, hoping technical fixes will solve the problems and eliminate ambivalence. This of course creates its own problems. These strategies can be individual, but in many cases have to be negotiated, especially when there is conflict over whether there is a problem, or over the ways to manage it.

11.13 The Sceptical Consumer: Satisfaction and Disappointment

Much of the consumer research literature focuses on the period immediately before and after the purchase of a good, trying to understand why someone buys it, and whether they are satisfied with it immediately afterwards. This

approach has been criticised from within the discipline (Mick and Fournier, 1998), and from consumption and domestication research, as not appreciating the evolving meanings of products and artefacts over time after adoption.

I would like to take issue with another aspect of this approach. There is an assumption that an individual adopts a product with certain expectations, and then they should be expected to feel satisfied with it. If their hopes are too high, then this satisfaction will be replaced by a certain disappointment. Writers on advertising and consumption, especially those concentrating on meanings of products claim that the images associated with products will always make them appear to be more attractive than they actually are, and thus disappointment is inevitable. The approach stresses the symbolic value of the good within a systems of symbols, which dominate the utility values, the meaning dominating the material values and use. It often implies that disappointment will be inevitable, for the good can never match its symbolic value. However, even more materialistic approaches would suggest the functions and usefulness of a product are normally hyped well above its actual capability to delivery the benefits.

Nonetheless, many consumer studies do show that people can be very satisfied with a product. Why is this? Probably because people have a quite realistic opinion of its usefulness and meaning. In my study I found that in general there is not a very positive view of new technology and its benefits. In fact many people have a rather negative view, and this is translated into non-adoption. Those who are forced to adopt, can discover benefits they may not have considered, and are not so surprised by problems. Expert users are also very sanguine about the benefits and problems. These products are not so unusual today, they are not so alien, and many people have come to have quite good ideas about the problems and benefits of new ICTs, through various personal and vicarious experiences. The consumer of new media is sceptical – few are taken in by grand claims for the technology built through the media. They come to it with jaundiced eyes.

11.14 The Major Themes of the Information Society

How did the research relate to major themes of social debate, such as those regarding the information society and modernism more generally? Current social science is developing themes that appear to be central to life today in developed countries. These themes are supposedly new ways to understand what is happening in a world where existing social structures are changing, where singular moral leadership is being replaced relativism made complex by the competing voices of alternative creeds, be they political, religious, cultural or economic. Great emphasis is put on globalisation, and uncertainty, whether it is environmental or social. Particular themes, such as risk, and the increase in uncertainty as these singular institutions appear to disappear are becoming very fashionable. How do we maintain a security of identity, how do we manage change in relationships, technologies, and institutions? How do we judge between competing claims, and how do we cope with many more opportunities or obligations to do so. What happens when the stability of family, job, society, government institutions etc. is in doubt? What happens to business when markets, products and expertise are changing?

A parallel and intersecting theory of modern life is based around technology. It is technology that is at the base of all these changes. Because of the way people are harnessing it, society and economy are changing. Any analysis of changing society has been be closely linked to technology. Technology is also posited as the solution to many of the problems or challenges that have emerged, whether previous generations of technology were responsible for it or not (McQuail, 1994).

I tried to see in this research how people were actually being affected by technology, and how they were harnessing it in their favour, as solutions to challenges they found in their lives, or as ways of fulfilling goals, or lifestyles they wished for or discovered. What I found was that in contrast to these rather universalising discourses, what was most striking, (although not surprising), about my respondents accounts, was their emphasis on the local and their own specific experiences.

The main findings were: a) The importance and presence of the family and of friends, both in dealing with everyday issues and with exceptional events; b) Change and insecurity in work and employment; c) Distrust of media sources, on whatever issue; d) Information overload, seemingly overwhelming amounts of information available and to be dealt with.

New technology was intimately wrapped up with the following themes:

The importance and presence of the family and of friends. Personal and often local relationships are still central to our lives. Old and new ICTs are used to hold together and to enable us to enjoy these relationships. ICTs are also focus of activities and topics of conversation and shared experience. These relationships are vital to encountering, judging, adopting and using new ICTs, not only in terms of information and advice, but also for practical help and exchange of goods and services. This raises issues of the difficulties of adoption and use in fragmented communities and those with little expertise, as has been addressed by digital divide research, but is rather positive as community and family interaction is shown was still very much alive, at least in these examples.

Change and insecurity in work and employment. Many changes in workplace organisation included the introduction of IT systems. Communication tools and Multimedia products are being introduced into many jobs and workplace activities. This brings many problems in the short term, and expectations of more problems in the long term. New ICTs are also offering people new work opportunities and ways of organising their lives, home and work, but this may be at the expense of making us personally more vulnerable to technical change and uncertainty.

Distrust of media sources. The media can be very useful, but are not trusted to give a relevant and correct view of the world, and of developments in ICTs. The media includes advertising and commercial hyperbole, a key feature of recent technical change. New media technologies do offer a certain degree

of ‘control’ over the media, and a new way of accessing information, but at the same time it appears to be just more of the same.

Information overload. In all aspects of everyday life, there appear to be more and more information of different sorts, both to assess or consume, and to produce. This includes communications with others as well as more anonymous information sources. While new ICTs can be used to control and even subvert this information flow, they are generally seen as the source of it: the technology is intimately linked with the information it transmits. ICTs not only demand the consumption and assessment of information, but also on demand information-creating actions, such as decision-making, which can be more onerous.

11.15 Methodological Successes and Short-Comings

The method I have used has two main problems: the design itself, and my implementation of it, which are interrelated. Since the method was rather novel, it has been very much a work in progress, to a certain extent made up as I went along. In some ways this is a pilot of the method, a first attempt to do a ‘bottom up’ study that crossed boundaries of home and work, linked users and non-users, and tried to follow encountering, adoption and appropriation processes.

Successes:

The methodology enabled me to successfully see how people draw on their experiences in al aspects of their everyday life and built up a complete picture of their life space, rather than one particular aspect.

It also enabled me to bring in non-adopters and those who were not interested in the technology who would otherwise have been difficult to involve in such in depth research.

The longitudinal aspect enabled me to follow the process of adoption and engagement with new ICTs that was not concentrated on only one aspect, i.e. the decision to adopt and the initial appropriation.

Failures:

The principal problem of this method is that the broad coverage produced a great deal of data that could be used in different ways, but did not provide enough to be able to answer some of the questions that were being posed, or delve deeply into the issues that came out in the analysis.

The second problem is the small number of people in the sample, and the lack of representativeness. However since I was looking for rich descriptions as an opportunity to study processes, this is not an important shortcoming. By showing that certain processes do occur, and presenting this evidence in the context of other types of study and theoretical reasoning it is justified and adds to knowledge in a way that can guide policy making and future research.

From the perspective of a participant observation or ethnographic study, my study could also be seen as too shallow, being based on only two short interviews with each respondent, and no long term observation. The defence of this is that more intensive research would have revealed little more about these processes at the level I was proposing. I was not trying to find out exactly how a particular technology was used in the social space of the home, for example, or follow every moment of the adoption of a particular technology. In fact these would be nearly impossible to do in most people's everyday life. I especially did not want to prejudge which technologies would be encountered, a selection of which would be necessary for a longer term ethnographic study.

Analytical problems:

As well as problems with the gathering of data, the interpretation and analysis was also highly problematic. The data was difficult to work with, not being focused, and covering a large range of issues. The research questions were not precise enough. The initial aim was to see how technologies came into people' lives and how they coped with them and exploited them. It was proposed that boundary crossing and social networks across traditional

boundaries would be important factors in these processes. I also was trying to draw a broad-brush picture without preconceptions about existing social categories, such as gender and age. A side-effect of trying to keep the study open was that focused research questions were not developed early enough, making it difficult to target the analysis.

There was also a problem linking a rather broad review of literature, often in unfamiliar fields to the empirical data, and unfortunately I was not able to address in detail some of the issues as I would have liked. The work therefore adds new elements from empirical research guided by the literature, rather than testing and applying existing theoretical positions.

11.16 Avenues for Further Work.

There are a number of possible avenues for further work, building on the study, the methodology and research design and on the empirical findings:

- A follow-up study with the same respondents, tracking how they have adopted or resisted 3 more years of technology development.
- A broader study with a larger number of people, and a more focused study that covers a broader base of people.
- Using the approach and focus to look at adoption in developing economies where there are fewer formal channels for support, and perhaps stronger use of the local and informal economy.
- Develop the technique of investigating social networks in detail, looking at broader networks, or different types of networks.
- A comparison of this methodology with other techniques of research
- A study of strategies of non-adoption.
- A study of *user and consumer subversion*, looking in more depth at the way people appropriate technologies, and undermine the ‘scripts’ of the developers and promoters.
- A general study of the role of informal local experts in the diffusion and everyday use of new and established technologies.

11.17 Summing Up

This study looked at the lives of a small number of people during a period of intense social and technical change, as digital technology moved from being the preserve of specialists to being a ubiquitous part of the economy, the national infrastructure and our everyday lives. In investigating the experiences, activities, attitudes and relationships of these few people, I was able to see a range of different ways of engaging with this range of technologies and the ideas and visions that accompany them. Despite many ICTs still only being used by a minority of the population, everyone I interviewed was able to talk at length about them.

Many new ICTs can be extremely useful, offer great opportunities for innovation, both for complex tasks, and for banal everyday situations. They can be used for instrumental and expressive purposes, to increase productivity, or to maintain and develop social networks and a sense of belonging. They give control, freedom, and flexibility. However as we encounter new ICTs we discover many problems. Despite many improvements, they are not yet stable or simple, or so cheap that there is no risk in adopting them. There is still a considerable need of specialist knowledge, on how to choose, buy, use, maintain and dispose of them. They cause us innumerable problems too, dealing with the technology itself, with the service providers, and with each other. There is considerable uncertainty in all aspects of adoption and use, that creates anxiety and insecurity. The meanings of many products and services are also changing as rapidly as the technologies themselves, creating conflicts and uncertainties over their value and place in our lives. Not surprisingly, many people want to keep life simple and keep away from technology as much as possible. However we often do not have a choice of avoidance, but instead have to cope with the imposition of technology. My study of adoption increased understanding about the way people reconciled ambivalence and contradictory attitudes and experiences with regard to ICTs.

As with many other problematic situations we turn first to our personal community for support, advice and help. This study showed that the personal community crosses over all boundaries of the life-space, just as the technologies themselves are doing. The informal economy provides information, advice, influence, practical help and exchange of products. It enables us to trial and consume technologies vicariously without having to commit ourselves. It also means that it is very difficult to avoid them as. Within the network there are specific individuals who for many reasons are relatively more expert than others, and willing to spend time to help and advise. These local experts are essential providing their community with opportunity to both adopt and avoid adopting new ICTs.

No doubt in the future we will become much more ‘at home’ with ICTs as we learn as individuals and as a society how to deal with them, but with the continuing rate of technical change this may never be finished. There will always be new products and services to deal with, and there will always be times when we want to cut ourselves off from technology that makes demands on our attention and time.

Appendices, Endnotes and References

Appendix 1 The Questionnaires

A1.1 Interview Schedule 1

Interview for PhD research 3/98
James Stewart
Questionnaire v 1.3.2

Name:
Date:
Place:

ALL NOTES AND RECORDINGS TO REMAIN CONFIDENTIAL AND ANONYMOUS

Social Situation

Looking for details of friends, best friends, family, work, colleagues, time spend in different places, travelling

How long have you lived in XXX?

Where did you come from? Are your family still there?

Where did you go to school ?
When was that?

Work
What is your job? (if employed)

Where do you work?

How long have you had this job?

What were you doing before?

Did you go to University or college, or do an apprenticeship?

Home
Do you live close by - how long does it take you to get here?

Who do you live with, or do you live alone?

How long have you lived with X, Y
(When did you get married?)

Children? how old?

Spare Time
Do you have much spare time, apart from work and home?

What do you like to do ? Do you have hobbies, do voluntary work? Etc.

(How important is this compared to any ‘paid’ work, or ‘family’ occupation)

Friends

Do you have many friends around XXX ?

Who are your best friends? Are they in XXX?

Do you meet friends quite often?

Family

You do/don't have a family of your own, how about your parents, brothers and sisters ?

Do you speak to them much, do you get on well.
What sort of things would you got to your family for - advice, money help.
Do members of your family come to you for advice and help.

Relations with referer - describe her/him?

Current Activities

Work/ School
Coming back to your work (or what ever relevent activity) - could you describe to me a typical day - briefly.

Do you have to travel much?

How do you get on with your colleagues - do you have much contact with them?. Are some of them your friends? (Do you see them outside work)

What sort of atmosphere is here - supportative. How much do you help each other.

If you need help with you job, either professionally, or perhaps emotionally, who would you turn to?

How would you compare this job with others you have done?
Do you know people doing your job in other places - do you have much contact with them -?

How much autonomy do you have, and how much is decided by other people - is you direct boss the one who make most decisions, or are they made elsewhere?

Do you have much contact with the decision makers?

Tell me about other people you meet during your work -

professional or personal relationships?

What equipment do you use at work ?

For example to communicate, write, as support
computer, telephone, video, TV, mobile phone

come back to this later...

Describe your day at school

How do you get on with the teachers - are there any you particularly get on with/ or not

What are your favourite subjects -
Have you any idea whiat you would like to work as, or study later
Are you free to choose - waht sort of advice to you get?
What equipment do you use at school - how much?

Do you work as well?

<u>Barriers between home and work</u>

Do you take work home? Is it important to 'leave work at work' when you go home.

Would you spend work time doing personal things? (such as phone calls, searching for information)
Can you divide your home and work life ?

Would you like to...?

At home

How long have you lived in you present home?

Could you descibe briefly it?

Do you rent or own it?

Who does the work around the home? is it you? How do you decide who does what *or* Does everyone have fixed jobs around the house

Do you or you family do most things, or do you get people in sometimes.

Do you have a friend or friends who you would ask to help you ?

Do you spend much time and money on your home?

Shopping

Do you have any money of your own to spend?
Who does the shopping for the house - everyday things?

How often do you go shopping for everyday things?
Do you go to the supermarket regularly
Do you use cornershops and specialist shops

What are the main criteria for buying everyday things - price, quality etc..
How do you decide in the family what to buy? tell me about it?

What do you spend your money on
How about shopping for things like clothes, luxuries?..

Do you ever use mail order ?Yes - no (suggest things like book club, cleaning products, clothes, specialist items)

What sort of things might you buy with mail order. Are there any benefits or drawbacks. What was the last thing you bought?

Large purchases

What was the last big item you bought - washing machine, car, TV etc?

Where did you buy it, or who did you get it from?

Can you remember making the decision to get it? Did you have to decide with someone else?

How did you make the choice -
Magazines, TV, friends, shop
Would you trust the sales person more than a friend or family in finding out about the product..

Repairs
If something goes wrong around the house, would you get someone to help fix it and give you advice - who would that be?

Hobbys and Entertaiment
(Ask about time with children or elderly relatives if relevent)
Do you have much time to relax at home?
By yourself - with family?

How do you normally relax at home?
What would you do by yourself?

Time divisions

Do you like to make some time to be by yourself? Have you got a place you can go to?

Media use
What sort of books do you read?
How do you choose your books

How much TV do you watch ?
What are your favorite programmes? What channels?

How do you decide what to watch - or do you watch whatever is on?

What do you not like watching?

Do you ever think you watch too much TV?

Do your parents think you watch too much TV? - Do they control how much you watch?
How important is the television to you?
To your family?

How about the radio?

Do you have any other hobbies at home?
Tell me about it

(how do they find out more, use media, friends etc0

What other things do you do in your or your families leisure time -
out doors
How do you decide what to do?

Information

Do you keep up with current affairs ? *the news*

Do you read the paper - which one. Do you buy it?

How about other magazines? *do you read magazines around the house - at friends houses? What do you like about them,?*

What do you think the most important source of infomation is for you - newspaper, TV, radio?

If you want to find something out, such as latest film, or what was on, would you look in the paper, or ask a friend or colleague?

Learning
Are you learning any new things at the moment, or recently - do you do night classes or anything like that.
For your own interest, for your work?

Where, how do you do it? Is it easy to concentrate and get on?

Friends

Do you go out with friends often?

What sort of things do you do together?

Do you have different friends for different things you do, or do you do spend most of the time with the same people?

Do you think you know alot of people - if you had to guess how many friends you had - could you give me a round figure?

Do you have a 'best' friend?

How important are friends to you?
(compared with family)

Money
How do you organise money in your household /yourself?
How much do you earn/ income of household - how difficult is it to budget?

DO you have a bank account? - Do you use the cash machine, or do you prefer to do into the branch? Do you have to use the bank alot?

DO you have a credit card - do you use it alot - how about thinks like debit cards - Switch etc?

Do you ever use the phone to order things, and pay on credit card? Do you use and of the phone banking services? How about insurance?

If yes, when - if no have you ever considered it, how rejected - do you know anyone who does?

Do you claim benefit of any kind - income, child? Where would you ask for information or advice about benefit

Do you have to fill in tax forms - who would you ask for help?

Technology
(Try and get stories about technology)
Ask about technology..

Is there a phone at home, at work?

Would you say you used the phone alot? Do you use it for work or personal calls?

Where is the phone in the house - *is it a place where you have 'private' calls - ?*

Who do you phone the most? Who phones you?

Do you have a mobile? How long? Who pays for it? What sort of calls is it most useful for? Do you know many other people with a mobile?
(if not) have you ever considered a having a mobile...?

Do you have an answering machine? How long have you had it?

Can you remember deciding to get it? Do you find it useful? Does everyone who calls you leave a message. Do you know people who don't like leaving messages?

Do you have a video? Do you use it much? Can you use it easily?
Did you work out how to use it your self, did you use the instructions, did you get someone to show you?
Do you have a video at work?

Do you have a video game - do you like playing video games? Have you ever played one?

Do you have friends who do? What do you think of video games -

Have you ever had to show anyone else how to use it?
Would you say you were the sort of person who gives advice or generally asks for help with new gadgets

Stories?
When you were growing up, did you have much 'new technology ' in the home. Can you remember getting a TV / video etc. How about a washing machine, or microwave? Can you remember when you first had to use a washing machine? Do you have any problem using one - do you sometimes get it wrong?

Do you have satellite or cable TV - Have you ever considered it? Can you remember how you decided to/no to get it. (Is there someone at home who would like it/ not like it).

When did you get it? Is it good value for money. What do you watch. Is this the reason for getting it?

Computers

Is there a computer at home? Is it yours?

For how long? Have you ever had some sort of computer?

What do you use it for?
Do think it is useful, how? Or is it more entertainment

Who uses the computer at home? What do they do with it, do you know?

you don't have a computer.. Have you thought of getting a computer...?
(*looking for reasons why)*

When did you get the computer. Were you involved in buying it?

Have you had to upgrade? Tell me about the upgrading?

Do you see much about computers in the papers? In the shops?

Do you have friends who have computers, or use them?

Have you had another one home.

Do you use the computer at work?

Could you describe the sort of ways you use a computer at work?
Was it just given to you, or did you have any choice.

How did you learn about it - did you go on a course?

Is there anyone at work who is official computer support, or is it an informal thing?

If you get stuck at home, is there anyone you can ask, or do you wait until you go to work.

Do you do work on the computer at home?

Are you happy using a computer? Do you experiment? Do you think it is important to find out everything it can do?

How would you describe your computer? computers in general?

Are there people at work who don't like the computer, are there friends of yours who you would call technophobes ?

Have you ever used the Internet?
What did you think?
Would you like to see it?
What do you think you can use the INtenet for?
Do you hear much about it in the media or from friends?
Who do you think may use it or want to use it?

Summary

How would you describe technology?
Do you think it is important to keep up with new technology?

What do you think of the way technology is changing. Do you think that is a good thing to introduce new technology?

A1.2 Interview Schedule 2

Interview for PhD research 12/98
James Stewart
Questionnaire v 2.2

Name:
Date:
Place:

All notes and recordings to remain confidential and anonymous

Questions for Second Interview

Introduction

Remind them what we talked about last time. – how long ago, what they were doing at the time.

Looking for events and role of social network?
Looking for decisions and changes in utility and engagement attitudes - practical outcomes of these changes, or practical triggers.

I am trying to find out about changes in their situations since last year.

Changes at home, work, personal situation, friends.

Looking for particular events: major life events, or minor occurrences that might involve new technology, or possible uses.

What has happened in your life since the last time we spoke?
Could you summarise the main things you have done or have happened to you and your family? We will go through things in a bit more detail, but just what you can remember as important events.

Work

Change job, get job, unemployed, promotion, big upheavals, new technology, new practices

Could you tell me about your job or work over the last X months.
Is your job still the same? Have there been changes in what you do, requirements of your work. What about promotions, expansions, bad times? Have there been any major projects? Anything Planned?

Do you have new colleagues, have people left. What are they like, what do they do?

Ask about use of technology - especially computers, but other mentioned in the pervious interview - use the activities and relationships brought out in the 1st interview to lead into the talk on technology
Have you introduced any new technology into your work, or had to learn new things?

How useful do you find it? Was the change worthwhile.
Was it easy to adapt?

How have you coped with this?

Have you been trained?

Do you help other people. Is there someone who helps you? How has it been accepted generally?

Especially Changes in communications and information needs and tools
Ask about particular changes in copingwith technology. Learning, changes in infrastructure.
Ask about relationships with others around the technology (based on previous answers)

Education

Change school, leave school, exams, new subjects, got to university/training, leave training, university,

You were doing X, last time we spoke, are you still do this, or have you finished, changed school etc?
What are you studying now?
Last time your favourite subject was, you were most interested in X, is this still your main interest?
Could you tell me what has happened at school, any big changes?

Do you use computers more? What do you use them for?

Have you done any training course at work, or out of interest, or to get a job?

Home

Moving home, spending money on home, people moving in or out
Similar angle to work

Discover if there have been any particular decisions to take, or any moments when awareness was raised. Who were involved in these moments?

What about at home? Have there been big changes there?

Tell me about them?

Changes in personal communications and information needs, habits etc.

Social

Relationships -- on or off, children, new friends, friend moving away or back. Family changes - marriages, deaths etc

Have there been any changes in your family – births, deaths, marriages, moving away or back, illnesses, changing jobs?

How about friends, any changes.
Any new neighbours – do you know them?

Ask about communications with friends, family.
Do you see them as much, still use the phone/e-mail/letter?

Ask about friends, family, colleagues, etc getting new technology, ask for anecdotes, stories (to be cross-checked or followed up)

Do you know if your friends or family have started to use new technology for anything – have you heard any stories?

d) Shopping

For purchases, ask how need arose, how decisions were made. What sources of information were used

Have you bought any big items this year? What, How?
Have you changed anything about the way you buy things? Are their new shops? What are they like? IS there new technology – loyalty cards, scanners, multimedia etc?

Money – is your financial situation the same as last time we spoke. Any changes?

Any changes in the way you do your accounts or banking?

Entertainment

You were keen to XXX last time we spoke, do you still so this a lot.
Read any good books, still watch the same TV?
Do the same sports and activities?
Activities - new hobbies, voluntary work, events
Are you still doing the same hobbies and other activities?
As much, or less? Anything new? Any changes in what you do?

Geographical

Ask about technology in the environment: in town, shops, banks, other places.

How about round your area, and in the town, have there been many changes. Have you noticed any new technology

Boundaries

Look for boundaries that are drawn - ask if they try to keep technology away from parts of their life, look for differences in information 'need' and use

Ask about changes in times spent on particular activities

e) Decisions related to technology

Look for voluntary up take, imposition, resistance, ignorance, decisions against
Look for reasons: cost, need, interest, anti-technology, confidence.

When and what new technology has come into lives, taken new role?
e.g. changes in use of computers, new tech at home
Decisions made

Is there any new technology use that you have not mentioned?
How did you decided to get so and so?
Where did you find out about it?
How does it change the way you do things?
How about other people around you?

Have there been any particular **events** that affect your decision or attitude

Who would you go to if you **needed advice** about computers – or who do you already consult?

When was the last time you had a **conversation** about computers or the Internet or some new technology?

Is it common to talk abotu computers - are there some people you would not talk about them with? And others you would?

Do you ever thing things would be easier without computers?

Is there a technology that you thing you can do without?

What is your most frustrating moment

Are their continual or chronic problems

Have you seen any articles on mm
Are their any TV or radio programmes

Creation of technology, content and uses

How did you come up with the idea.

What other similar products and services are available

How do you find out about your market - how do you imagine people using the technology.

Do you use it yourself?

Who do you test your product on - sample, yourself, friends, colleagues

Is your market computer users - how do you see that growing?

What is the evolution of your product?

Do you see rapid technical change a benefit, or a problem for you?

How do you chose the tools?

With your artners, colleagues, do you have much discussion about how the product or service should be shaped?

What advantages or facilities do you think multimedia brings to your work?

Is it a tool for doing you work, or as a suport for other activities related?

How much time do you spend on research on new technologies, the market, competitors products etc?

Why is new technology a good investment, as opposed to other means of doing things?

What are the draw backs?

Part two

Looking at awareness and engagement with new media technology away from that mentioned in interview.

Suggestions:

Use pictures

Accompany some of the respondents during part of their day. e.g. shopping, working, watching TV, going out,

Awareness of IT in everyday life

-e-mail, Internet

-new work tech use

banking, shopping

entertainment

How have changes happened?

-economic

-geographic

-Social

Opportunities turned down

Decisions that went against tech or info use

Events that changed experiences

Broader Awareness

Looking for non-everyday awareness. Some of these pictures and topics have strong everyday presence none the less, others, at the end of the list, are more global and touch us less.

Do you know about ideas of the information society?

Do you know of government polity to do with new media and new technology.

Show picture of:

ATM - banking, changing money, Euro, end of cash

WWW Page - the Internet, pornography, information, news,

Telephone and mobile telephone - new services, regulations, globalisation

TV - sat and cable, digital TV arrival, interactive TV, regulation

Radio - digital radio

Car - in car electronics, traffic management,

Traffic camera

Cash Till and loyalty card. Personal information collection

Security Camera - surveillance

Junk Mail

Music

School - computers and schools Internet and schools and children

Hospital - health care, personal info,

Government document - P45, electronic government services

DOOM screen - awareness of video games and culture

Stock exchange - global finance
Tank - effects on war, electronic warfare, Gulf War

Some of these subjects will have very local or personal resonances, but awareness of implications, technologies, laws etc behind are expected to vary considerable. Others are more abstract, or global, such as military and war, or international finance.

Relevance of this discussion to future expectations

Do you know much about the industry that makes computers and new technology – Do you think that they really try to develop products that people need, or are they more concerned with technology for its own sake

IS investment in technology for education a good allocation of government funds

Who would you go to if you needed advice about computers – or who do you already consult

When was the last time you had a conversation about computers or the Internet or some new technology?

Do you ever thing things would be easier without computers?
Is there a technology that you thing you can do without?

What is your most frustrating moment

Are their continual or chronic problems

Have you seen any articles on mm
Are their any TV or radio programmes

A1.3 Notes on interviewing children under 12.

I had to interview a 7 year old and a 5 year old. Children of this age have developed basic mental constructs (Hodge and Tripp, 1986)p.86, but fairly

basic ‘dramatic contrasts’. Abstract forms are unlikely to have developed, and these children will use small scale, functional structures in understanding the world. Abstract and critical thought is unlikely before 12 years. These are some notes prepared for a more focused interview/encounter.

Children’s interview

Look for General activities
school
play
household/domestic activities

Specifically:
Describe the day,
Their school, (teachers, other pupils, what they study, what they enjoy
Their house, their room, their play areas, the kitchen, parents areas
Parents - what they do, who does what

Ask about play
what games, who with, where

Use of TV, computer
How much TV do they watch.
What programmes
describe programmes

Parents restrictions

Computer -
When did they get it?
Do they use one at school or friends?
what do they do? favourite activities.
how do they use it?
why do they like it?
Do they talk about it with friends.
Ambitions
USe of metaphors from computer in play, use of characters from games, CD-ROMs

Look for:
attractions, difficulties, uses, help sources, self help, subversion of adults, knowledge of possibilites, specific knowledge of uses and programmes, expectations and desires, langague and technical expression, and how they are used.

Reading books

Friends

Who are their friends, where do they live, what do they do together?

Do they use computers, or games or TV together.

assuming they do not buy much themselves: ask about presents

When the next birthday is, or Christmas. What would they like

Techniques

The child is with a largely unfamiliar adult, being asked questions that may or may not be unusual. The family are strong on education, I image that the parents use questioning about what happened at school, about the surrounding world as an educating method, so my questions may not seem unusual.

Avoid overtly analytic questions, and questions asking for reflection. None the less there may be some advantage in trying.

Use informal language, or low register language. The introductory conversation with the parents may help me to pitch the language.

Come down to level of the child. Sitting on the floor etc. Ask parents how they would normally play.

Ask for demonstrations of how computer is used, from turning on. Ask then to do a drawing, play with a CDROM or a game. Ask about what the computer can do, and get them to demonstrate. Ask them to show me how to do it.

A1.3.1 Reflections

The interview with the 7 year old was much more effect, he lead me around the house and introduced me to all the things he found interesting and relevant, including the device for checking he had not wet his bed, his computer, various gadgets around the house etc. He mediated between me and his younger brother. The younger brother was much more confident on

his computer, and I used talk about the computer to get him to open up to me.

A1.4 Pictures as aids to talk about technology and information

The pictures act as aids to facilitating talk about technology. Rather than just being faced with the interview, and the questions, the picture gives something else to talk through, concentrate on, and provide ideas. Rather than bouncing back the words of the interviewer, the picture provides non-verbal supports.
A common set of pictures allows comparability across people and groups.

Choice of pictures:
A) pictures of everyday or commonly known and experienced places, institutions, objects. These can be directly associated with uses of multimedia networked technology, or represent a field or sector of uses (e.g. travel agent representing tourism, travel etc). In these the technology is the choice.

B) Pictures of places etc that are relvent to many activities, not necessarily using tech, but could prompt more general converstation that could be steered to awareness of technology and info. this could include pictures of shops, activities such as sport, hobbies. They may not however directly connect. A picture of a footballer representing sport may not work for someone, for whom another sport is appropriate.

Possible pictures

Telecommunications	mobile, e-mail, competition, lower charges, new functions	phone box, mobile phone, aerials
Computers in education	computers in schools, Internet, distance learning	school, kids and computer
retailing:	loyalty cards, ordering, stock management, direct marketing, credit/debit systems, supermarkets	small shop, supermarket, home shopping channel, loyalty card

transaction	e-cash, credit/debit cards, Internet purchasing	credit card, coins
television	multichannel, digital, interactive, choice, ownership	TV, satellite dish, cable box, teletext screen
shopping		
banking	ATM, home banking, data mining	ATM, bank
government info		
benefits	electronic payment, kiosks, efficiency	DSS office, payment book
outdoor activities	position finding, safety	GSM, clothing
workplace communications	e-mail, cscw	computer in office, e-mail
transport	management systems, design	taxi, train, cars, traffic lights, motorway, car
financial markets	global markets	dealing room
Intellectual property		
art	value of artifact, multi artist,	gallery, painting,
family life	tvs and computer in different rooms, generation barriers, e-mail for communication	family round TV
pubs and entertiament	pub managemetn systems, video, music, lights	pub, disco club
cinema	special effects, home cinema, vod	cinema, special effect still
holidays/tourism	on-line booking, personal and agent systems	travel agents, holiday resort
sport	multichannel tv	football match,
gambling		roulette wheel, betting shop, casino
sex and pornography	online porn, Internet chat	top shelf of newsagents
music		CD
advertsing		bill board/ TV ad
politics		Houses of Parliament
manufacturing		
food production		Farm, abattoir
time management		diary
religion	Internet run cults,	mass suicide, www page
home management		alarm, Hoover, house
Privacy		
security		cameras, locks, car alarms
crime		police, jail
essential services	management systems	ambulance, police

learning	distance learning, lifelong learning, home learning	open university, virtual college www, prof exams
reporting	computer report, electronic filing, archives	computer at desk
news		
healthcare	management systems, research, surgery, drug design, hospital equipment	hospital, red cross, X-ray
environmentalism	monitoring, pressure groups, modelling	
energy		radiator, power station, electric socket
military	electronic warfare, war reporting	gulf war pictures, tank, battleship inside
culture		
design	CAD, multimedia	clothes, furniture, building, CAD

Out of this huge list I chose enough to represent a variety of different perspectives and issues. These photos were also used in teaching classes about the information society,

There are two ways to use them:

A) one to go through sequentially. Benefit, same for everyone, Problem: but talk may be weak at beginning; my order would then have an effect on ideas.

B)Let them choose from seeing them all. Lets them find something they can talk about more easily, shows something they know about, engage with initially. Problem :the aethestics of the image would have an important effect on choice, as much as actual 'content'.

I chose the first method

<u>Measurement of reaction</u>

Method 1 : record interaction, analyse qualitatively, wooly, but richer
Method 2 : have a scale to rate the answers, test on trial group.
Method 3 2+extra notes
To what extent should I promote them, bring in issues they have raised.

Look for understanding, strong reactions, controversy, disinterest, engagement, experiences?

A1.4.1 Results of using photographs

Using the pictures was only partially successful. What they did reveal is how little knowledge most of the respondents had about the ubiquity of ICTs and the way they are changing so many different institutions and activities, from transport to the military. Because of this ignorance I had to fill in people more about what they pictures were about. Occasionally they would give rise to an enlightening story, but often they would make the respondent feel a little ignorance of the subject. Luckily it was the last part of the study. It worked much more effectively in the group situations, stimulating debate between a couple or in a group, as there was always one person who could start the conversation and it enabled me to listen more.

Appendix 2 Details of the Respondents

A2.1 Group1

A2.1.1 Introduction

The first network, Group 1 is a group of 6 people I found through initial contact with an acquaintance Valerie. Valerie agreed to help as favour and I was able to try out and practice the interview with her. Valerie named five close contacts: four women and one man. Four are in her family, her parents and sister and niece, and one is a colleague, Amanda. Valerie named her sisters and mother as those she speaks to the most and shares the most things with, although they live on the other side of the country. The group includes two school teachers and Valerie's family, which spans three generations. I interviewed her retired hotelier parents Helen and Mike, her sister Fiona who owns and runs a nursing home, and Fiona's daughter's Laura (12) and Lisa (16). The group is mostly women, and most of them have little interest in new ICTs, although computers are very much part of their every day lives.

A2.1.2 Valerie

Valerie is a senior teacher in a primary school in a small town near Edinburgh. She is aged 40, and has worked as a teacher for 10 years. She was brought up in the West (of Scotland) Argyll, where her family still live. She went to school in Oban, then took a degree in education. Before beginning her career travelled extensively and did a variety of jobs. She has lived in Edinburgh for 11 years, and worked in the same school for 8 1/2 years.

The school is in a neighbouring town, and is in a rather poor area She has a responsible position at work, years and is actively looking for promotion in the same area. She teaches full time, and works with the head teacher to interpret the continual flow of new curriculum material sent to school, to help

other teachers apply it. This involves a great deal of reading and planning, including taking work home, on top of classroom teaching and report writing.

She lives by herself in her own flat in the city, about 7-8 miles from the school. Valerie divides her spare time quite rigidly from her work (she tries not to socialise with teachers, except for her friends who are teachers). She is very active outside: swimming, badminton, squash, she likes to go to the theatre, films, like dancing. She does most of her activities outside the home. She has many friends, but is closest to her three sisters with whom she speaks regularly on the phone. her closest friends are Amanda and another woman who is also a teacher. During the time of the interviews she had a boyfriend from Latin America. She is not to keen on watching the TV, preferring radio and newspapers. She values an activity lifestyle and being with other people over spending time in from of a screen. However she is quite confident with using ICTs including the computer which is used extensively in the classroom. She also uses video, television and video camera in the classroom.

A2.1.3 Amanda

Amanda is a friend and colleague of Valerie. She works in the same primary school near Edinburgh. She has been teaching their 4 years since her probationary year. She went to school, University and teacher training college in the same city. She was brought up by her mother in the east side of the city, her parents having separated. At the first interview she shared a flat with a mature student, who's family own the flat, and he looks after it. Her other flat mate was in Africa for a few months. However this was a period of considerable change in her life. By the second interview she had got engaged, and bought a flat and a car with her boyfriend, another teacher.

Amanda has plenty of spare time outside work. She likes to go to the cinema, normally two times a week, and she goes swimming twice a week. However her main social activities are going to friend's houses for dinner and going to

the pub. When she stays in she likes to watch TV, especially the soap operas. Nothing else much interests her on the TV. She likes to keep up with current affairs, with the radio and occasionally a newspaper. She watches most of the main cinema releases, and uses the cinema's own guides to get the times and programmes.

Amanda is very cautious of new technology – worried that she will break something or make something go wrong, or that she will not be able to manage it. She describes how she has got over her initial 'fear' of new artefacts – the answering machine the video, her CD player, computer at work, and is especially proud of having worked out how to programme the CD herself. By the second interview she had been obliged to learn to use a computer to write reports, and had become much more curious about new ICTs, having bought a mobile phone and considered cable and satellite television. She uses the computer at work for teaching. She went on a course, and has colleagues who help her. She did not have to write essays on the computer at college, even though they were available, and feels she is the generation that missed out on learning them early. She has used the WWW, with her flatmate and her mother, who works in the University. She sees it mainly as an entertainment, she has lots of friends with computers, but they tend to use it mostly for games. She can't see herself using the Internet. She is not interested in shopping on line, or shopping at all, and is not interest particularly interested any of the new applications.

A2.1.4 Fiona

Valerie's sister Fiona is 41 years old and lives with her husband and her youngest daughter in a rented house near a town on the west coast of Scotland. With help from her husband she runs a residential home in the hotel she bought from her parents eight years before. She trained as a mid-wife, but moved into hotel management first another Scottish town, then the local one. She manages 26 staff and 26 residents, and has a network of contractors to maintain the home. She married 18 years before and has two

daughters 16 and 12, the oldest one is away at boarding school. However her husband has been sick with ME for 12 years. She appears to have a comfortable income, managed through an accountant.

Her business is fairly stable, but involves a constantly being on the phone arranging maintenance and supplies. By the second interview a number of the clients had died and she was busy advertising the business. As well as running the business, she has a busy life outside work, and loves outdoor activities. Since her husband has been sick she has tended to get out and do the things she enjoys. As her children grow up she has more time to explore new interests, including climbing, playing music and gardening. This way she makes new friends. She is in close contact with her youngest sister is married and lives in nearby. And with her mother and father who live in a house behind the hotel. Fiona has lived in 12 houses since she moved to run the nursing home, and she and her husband designed and built a house that they moved into during the time of the interviews. She does not involve herself much in the life of the town, except as President of the Horticultural Society.

She uses a computer at work, although her husband takes more responsibility, and they have an electronic banking terminal. Most of the accounts are done by a professional. She owns a mobile phone, but does not like to use it – she likes to determine when people can contact her. At home she does not like to use the phone much as she uses it so much at work. She occasionally watches television, but does not agree with screen based entertainment. She prefers to keep away from technology and keep her life ‘simple’. However she had taken a computer course with her sister Valerie many years before to make sure she knew how to operate one. By the second interview she had become more interested in knowing about new ICTs, if not using them, particularly since her daughters are becoming enthusiastic, and she sees the importance to their lives. Her brother in law is also starting to use the Internet to build his craft business, and the climbing club runs a web page with information of their activities.

A2.1.5 Laura

Laura is 12 years (13 by 2nd interview) old, and lives with her parents near Oban. She is at high school in the local town, which she travels to by bus. The previous year she was at the small local primary school. The high school takes borders from the outlining islands as well as more local children. Her mother and father run a retirement home nearby, but her father has been sick for 12 years and does not play a very active role. She has an older sister, away at boarding school. Laura's favourite subjects at school are 'tech' and 'IT'. She would quite like to be a vet, but it is not really on her mind. She enjoys swimming in the local pool, her mother takes her hill walking, and she like to go for weekend ski trips with her family. She has a few friends and a cousin who lives nearby who she sees often, and plays video games with. She has been confident with computers since primary school, where among other technology they used video conferencing to communicate with pupils in other small school on the islands.

A2.1.6 Lisa

I only interviewed Lisa as part of a group interview with Laura, Fiona and Valerie, so did not find out much about her. She is 16, and studying at a private school in Scotland. At school she enjoys technology and IT subjects, and uses the Internet. Many students come to the school from abroad, and international communications are important to them.

A2.1.7 Helen

Helen Stewart is in her late 60s, and lives with her husband in a small house they built themselves when they retired nine years ago, behind the hotel that they built and ran in since 1971. She has four grow daughters, two of who live nearby with children of their own, and the family seems quite close. She and her husband have been retired since 1987, and although their income and standard of living has been generally higher than the average, they do not have a pension, and live from investments and rent on some land. Helen

still involves herself with the hotel, now a retirement home run by her eldest daughter, and does all the baking. She also bakes for the local shop in the village centre on the other side of the river, where she also gets the village gossip. Helen was working in the big hotel in the village which belonged to her future husband's grandmother when they met, and after marrying they went to Sri Lanka to work in the plantations. After 3 years they returned and worked in the hotel until his mother's death, when they built a new hotel of their own which they ran until they retired. The hotel brought them into contact with foreign and English visitors and they enjoy travelling abroad to see the friends they made. She says many of her local friends are dying, and the younger locals are moving away to be replaced by immigrants from England and central Scotland.

She does all the shopping and housework, and is responsible for by electrical goods, and operating the video for her husband! She prefers to be baking and cooking or knitting to sitting and reading or watching TV. She does the crossword in the paper does not read much of it. She uses the phone to contact her children and friends.

I conducted 4 interviews in the afternoon, and in between chat to Helen's third daughter, Marie, who is staying with her mother while she and her husband look for a new house in Edinburgh. She has a small boy (21 months) and is pregnant again. She is a nurse.

A2.1.8 Mike

Mike Stewart is 71, and lives with his wife in their own home. His family was from the area and his mother and sister still live near by. His grandmother owned a hotel in the village from before he was born. Mike likes a quite life, and spends time in his workshop with, where he can repair tractors and cars as a hobby. He has always been active in practical mechanical engineering. He spends time in the garden and grows all the vegetables for the table. He likes to shoot, but does not have the money, so now enjoys being a beater for a local shoot. He has his chair next to the television, which he watches 'too much'. He reads the paper everyday. He enjoys sport on the television in particular, and is annoyed that more and more events are moving to pay TV.

He likes to use media technology, but feels divorced from it – he knows how to fix mechanical technology, but never learned electronics. He lets his wife run most of the home – shopping, communicating with the family, cooking, etc, and an accountant advises them on finance. They do not have a great deal of money, but like to save for travel. He does not have many friends, and is not bothered. They visit friends in England every year, but most of the time he is content to spend time in his garden and with his family.

A2.1.9 Other members of the network

The respondents mentioned a number of other people in the network that were important to them, especially in relation to ICTs. Helen and Mike's son in law run's a business which he is developing with the Internet. In the school, there are other teachers who resisted computers, and a school expert responsible for helping them. Fiona has a friend who is a business woman in London who bores her with stories of her computer !

A2.2 Group 2 introduction

A2.2.1 Introduction

The second group I found after a search for artists working with multimedia. I thought this would be an interesting group, with the principal respondent being conversant with consumer and creative ICTs, but with an interesting perspective. I suspected that their might also be in a milieu where computers were not commonplace, but where invention and experiment were common. I had tried visiting 2 art galleries/collectives in Glasgow working with TV media, but failed to find anyone. An e-mail to a Scottish multimedia list provided me with a contact, Andy, who was doing a masters degree in fine arts at a Scottish University, doing his dissertation on multimedia in art, including creating a number of experimental works using computer graphics and sound. The group turned out to be all men around 40 years old, and most of them heavy users of ICTs, designing multimedia, researching information, publishing and communicating for work and in their personal lives.

A2.2.2 Andy

At the time of the first interview Andy was about 40 years old, and worked part time in a college of further education designing multimedia education projects. He is a working artist who trained in Scotland, where he was born, and worked on a number of projects, including setting up a sculpture workshop in the Highlands, where he was director and a similar project in the city. He has also lived in New York City. He does not sell his work, partly on moral grounds, and exhibited only in public exhibitions. He did his masters degree in fine arts and found part time work in the college after doing a training course in the technology at a local University as part of a retraining course. He got into using computers a few years before as the only way he could see of creating the art works he envisioned, particularly for generating sound sculptures. He was initially on a work placement scheme in the Computer Enhanced Learning Unit, but was offered part time work on

multimedia projects that were coming in to the unit. In the job he had very little money, and lived in a small flat in the city with no phone and few comforts except his computer and a small TV that was constantly on. By the second interview he had a new job as a web designer in a University department specialised in researching the place of new technology in the arts, and he was considering doing a PhD. He had a flat with a phone a donated TV and video a living room dominated by a computer and computer magazines and the hall filled with sculptures. He has strong views on technology, art and politics and how they are related. His work as an artist his his main preoccupation and activity, with paid employment a means to an end. However they are increasing coming together and influencing each other. He is self reliant, but ready to turn to others for help and advice. He particularly works with arts works that intrude into physical space, and sees interactive computer based art as an extension of this. He has become a self confessed computer addict, an interest he shares with his colleagues, his friend Trevor, and his brother in law. He dislikes the media and does not read newspapers, instead preferring art books and science fiction, a passion he shares with the others in the office.

Andy as my main contact, and I built the group round people he nominated as important people in his life. Part of that group were those who worked with him in the multimedia design office. Noel, the head of department, Neil, the graphic designer and Alec the technical specialist. I interviewed these three. Andy suggested I speak to his friends Trevor and Nigel who are artists working in the north of Scotland, with whom he had worked for many years, his sister and brother in law, and another friend. I decided to interview Trevor and Nigel, because Group 1 was largely made up of family members, and from Andy's description of them, they appeared to be very interesting people.

A2.2.3 Noel

Noel is head of the small multimedia department in the college, which he instigated and set up. He is in his early 40s, married to a doctor, with two young children. He has recently bought a new house. He has lived the city

for 15 years, moving here from Newcastle where he studied astronomy in order to do an MSc in astronomy. After this he started teaching in the college. He is very self-motivated, with many talents. He has a relaxed management style and personal relationships. He is not motivated by career, but by ideas and people. Noel works with a team of 2 permanent staff and a number of casual staff. He has expertise in teaching and learning, art and design and in computers, so is able to supervise and plan all aspects of the projects.

In 1992 he wrote a paper for the Principal of the college on the possibilities of multimedia in further education, and was paid to research this. This has grown though various stages to his present job managing the Computer Enhanced Learning Unit, which does a number of multimedia projects and supports multimedia in learning across the college, but he is mainly focused on developing an open distance leaning project based on computers in homes and libraries. He has to deal with the continual financial and work pressure of the college, and persuade staff and management to get involved in new technology, for which they get no extra money and little support. Noel had a senior sponsor, the Vice Principal, until very recently, but now he has left, and his direct line to senior management has dried up. Unfortunately during the research Noel left to with in a government agency devoted to promoting and supporting new media technology in education and I was unable to interview him a second time.

Noel is a self confessed gadget enthusiast and an information ‘junkie’. He has powerful Apple computers at home and at work, and carries his documents on optical disks., He has e-mail in both places. He organise his life with a Psion 5 organsier, which he uses to write wherever is convenient. He is a frequent phone user, but resists a mobile phone, as he does not want to be contacted when he is trying to get away from the phone, and is always within one hour of being near a message point.

Noel has a number of friends, and two close friends in Edinburgh that he sees quite often. Although constrained by his family commitments, he tries to

go out with one of them every fortnight for a drink. He plays in a band, and organises gigs for it. He also has a private publishing company he runs with one friend from the band, publishing music and books on music. His has become a more serious business in the past year. He uses his music and IT skills for this including run a WWW page.

A2.2.4 Alec

Alec is the technical expert in the department, setting up and running the web servers, writing code, advising on operation of the machines. He is also paid to track technology developments and provide a report to the college. He is in his early 40s, and has lived in the city for most of his life. He father was a bookbinder, and an amateur radio enthusiast, so Alec and his brothers and sisters grew up surrounded by electronics, fixing televisions and rewiring the house from an early age. This interest evolved to early personal computers when he bought his first machine in 1981. How this interest was purely a hobby. He worked for many years in purchasing and stores for the college, developing the knowledge and attitude of a professional buyer. An accident forced him to leave the job, but instead of retiring he managed to convert his hobby into a new job in the Computer Enhanced Learning Unit. Like Andy and Noel, his paid employment is not his only ‘work’ activity; Alec had also been a volunteer in a youth organisation, which he had to stop since his accident, but expects to restart.

He has his own home and is very self sufficient in running and maintaining it. His accident curtailed many of his interests, including hill walking, so working with the computer has become a more important activity that crosses his home and work life. He is a keen media user and uses the Internet, newspapers and magazines to keep up with current affairs and technological developments. He is close to his family and has many friends around the city in a network built up since his youth. Many share his interests in ICTs. He uses e-mail extensively for his work, which involves local and Europe-wide projects, and for his social life. He also has a mobile phone. He experiments with new Internet technologies and applications both from personal interest

and professional work, and has clear ideas about what works, and where the future lies.

A2.2.5 Neil

Neil is the “creative force behind most of the electronic educational aids that we have in the college”, and creates all the graphic interfaces for the multimedia and Internet applications the department produces and maintains. He also teaches use of computers in the college and in a community training centre. He is in his late 30s, is married to nurse and has two young children. He lived in the city, but by the second interview he had moved, and now has a 40 minute commute to work, which he does this by motorbike. He has a degree in graphic design and an HND in print technology. Before his present job he lectures in creative arts, but took the opportunity to move to his present job when financial cut backs affected this post. Like the others in the department is does commercial and college work, including designing web sites for companies and for on-line learning. He designs the web sites by intuition rather than scientific principles, but he has always tested his designs on people around him.

His hobby is motorbikes, an interest he picked up from his father, but he does not feel he has the same affinity with machines as his father does. He participates in a motorbike club and many of his friends are motorbike people, from a wide variety of backgrounds. Most of them are uninterested in IT, although he sometimes finds himself explaining things. His closest friends are not all in the city, but spread around the country. He talks to them by phone regularly.

He uses a computer all day at work, and e-mails all the time, both for projects and to friends. He has a computer at home that he has borrowed from Noel. He is proud that his 7 year old daughter is getting good at using Photoshop. His wife uses a computer at work, but has no interest. His father was a miner and a policeman, and tries to understand computers, but his mother has no interest and always tries to change the subject. Neil read the paper on-line,

and is keen on new applications of the Internet, including mail order for rare motorbike parts. He does not take much notice of news about innovations, as he can rely on Alec to tell him of anything interesting.

A2.2.6 Trevor

Andy suggested I talk to two friends who live in the north of Scotland, Trevor and Nigel, who are working artists, and run an exhibition curating company together. Trevor lived with his partner in a rented cottage at the time of the first interview, when I met Andy, Nigel and Trevor together, but by the second interview he had bought a small house further north in a small village on the east coast. Trevor is in his early 40s. He is originally from York, where his father was a miner and then worked on the shop floor in a manufacturing company. Trevor worked in a sculptor's foundry in London when he left school, and then did various jobs, including delivering art, to support his art work. One of the jobs was working in an insurance company where he became familiar with computers. He applied for a job in Inverness for the local authority, delivering and mounting touring exhibitions and came to Scotland to do that job for four years. Frustrated with this job, he left to set up his own company with a friend, Nigel, and now they find funding to curate exhibitions themselves. This includes EC funding and mounting international exhibitions. He works from home, but has to travel a great deal, and relies on electronic communications including phone, fax and e-mail. He also prepares the supporting material for the exhibitions at home. His partner designs specialised felt clothes, mainly for the US couture market, and has a small workshop where she make them. They both run international business from a small Scottish cottage!

Trevor's friends are mostly in London, and his family in York, which makes visiting difficult. He found it hard to make new friends with similar interests in the sparsely populated area. He uses e-mail and the phone a great deal for his personal life too. He was introduced to using computers by Andy, and now owns a powerful Apple computer and desk top publishing equipment. He has become a local expert on computers for the art community., and

participates in on-line groups with other users. Trevor is a regular newspaper reader, and uses the radio more than the TV for news. For local news he depends on word-of-mouth. He prefers to read as a leisure activity. He does not have a mobile, since the coverage is very poor, and cannot get broadband Internet access either, although he would like to. He is generally keen on new innovations in ICTs if they can improve his communications and business.

A2.2.7 Nigel

Nigel is Trevor's business partner and friends. He lives in a very small caravan on a hillside overlooking the sea, in the middle of farm land up a long muddy track. His caravan is heated from a wood stove in the middle. Among his minimal possessions are a fax machine, and old Apple Mac and a telephone. Outside there is a large concrete area with large pieces of slate his is sculpting with sophisticated power tools he keeps in a large box. He was brought up in various places around the UK, as his parents travelled, and went to school in different places, doing some A-level sin science before travelling and working around the country. He eventually did an art degree, and post graduate course and came to Edinburgh to help set up a sculpture workshop. He art is focused on installations and sculpture, especially themes that link contemporary, conceptual work with historical themes. His project when I visited were based round using slate from the once important but now defunct Ballahuillish quarries, integrated with historical themes from the village and micrographic images of vegetation. Eventually he moved north and set up the business with Trevor.

He does a great deal of research for his work, particularly the University libraries. He reads the newspaper, and books, and listens to the radio, but does not have a TV. He communicates by letter with many friends over the country. He meets many people though his work and recreation. He exploits whatever technology he needs for his work, including chemical eching, electron microscopes, digital cameras. He owns a professional camera for his art works. However he is not at all keen on computers, which he never

needed before the present job. He uses his Marxist views to explain his dislike and distrust of computers, but Trevor claims that it is his lack of confidence that is the problem. He sees the use, but is unhappy with the perfect standardisation of computer produced material that degrades the value of printed books. He also would not like to use the Internet in place of libraries, hand written letters and the telephone.

A2.3 Group 3 Introduction

A2.3.1 Introduction

I started to find this Group by advertising on mailing lists for multimedia developers. I wanted to look the environment in which multimedia products were being developed, to look at their social network, influence and influences across home and work. I thought this would be a main respondent who was highly engaged with the latest technical and industry developments. I had a reply from Maurice, a computer software trainer who was also developing a multimedia city guide/e-commerce project part time. However when I spoke to him in more depth he admitted he worked alone and had few friends, and suggested that his wife, Ruth, could be the principal respondent. Group 2 had turned out to be a group of developers, so this was an interesting alternative. It turned out that their were a number of similarities with the other groups, with some of the members of the group sharing similar jobs (school teacher, higher education college), and family status. Ruth introduced me to two of her children age Daniel, 5 and Joe, 7whom I interviewed (one is autistic) and watched playing computer games. Also interviewed her parents, Dorothy and John, her colleague, Maura, and a friend, Mary, a teacher and her husband Terry and manager at a commercial biological testing laboratory.

A2.3.2 Ruth

Ruth is in her late 30s, and teaches adults with learning and physical disabilities in a higher education college. She is married with 3 children, and has three grown up children from a previous marriage. She is very busy between her work and family, especially with her husband working away from home, and managing restructuring and cuts at work. She was also doing a distance education course for her work during the year I interviewed her. She was brought up in the city, and most of her friends and family are around, although her grown up children are in London and Hong Kong. She trained originally as a nurse, then did a degree in teaching and specialised in

working with disabled children. Later she then did a degree at the Open University and moved into further education for adults.

Her work is based in the college, about 20 minutes from home, and also in locations further afield. The work involves expressive and close relationships with the students, and administrative office tasks. Technology plays virtually no part in her teaching, but is coming into her administrative tasks. Her students however use computers in other parts of their education. She shares an office and an answering machine with her boss and several colleagues. She likes to keep her work separate from home life, so that although she works very hard and often has to stay late, when she comes home she can switch off and concentrate on looking after the children. She has a nanny, but has very little time to herself., since Maurice is away often during the week. She manages to watch TV for half an hour as a way of getting her autistic son to sleep, and has some time free to herself on Saturday morning when Maurice takes the children shopping.

However the division between work and home and her own free time changed during the interview period as she started a distance learning management training course. This involved reading a great deal and writing essays which made her even more busy. She was expecting to learn to use e-mail and the word processor, but the organisers could not get the system working, and her husband did all the typing.

She does not like to go shopping, and buys all their clothes from local second hand shops. However she buys her Christmas presents though high street mail order catalogue, and prefers to buy everything except clothes this way. She reads the paper, listens to the radio and likes to keep up with the news. She relies on her husband to read magazines, and do product research.

She has a close network of friends she relies on a great deal for support, and sharing ideas, and they see each other at home quite frequently. However she does not like to talk on the phone as she spends so much time on the phone at work.

She is not enthusiastic about ICTs but is curious, and started to find out about the Internet and got a mobile phone during the interview period. This included sending e-mails to her daughter in Hong Kong.

A2.3.3 Maurice

Maurice is in his late 40s, and works as a trainer in software products such as operating systems and Internet applications, travelling around the country and the world teaching in companies, working for an agency. This involves being away from his family during the week, but often gives him weeks at home, where he learns the material he has to teach and develops a multimedia product that he hopes to sell in the city. He divides his time equally between the two. He was born in England into a professional family and did a science degree and MSc, but after a few years left and did a variety of jobs in research and industry specialising in a branch of mathematics, living in London and Stirling. He took his present job because the high pay enables him to work part time. He runs his accounts through his own company that also funds his project development. His works very hard on his project, designing and programming, but the commercialisation is a more difficult proposition. He uses his own personal experience and his family as source of inspiration and testing..

As well as three young children, Maurice has two teenage children from a previous marriage, one thirteen, and the other has start to study computing at University. His younger son stays with him on occasional weekends, and is the hero of the younger boys, especially when it comes to video games. He used to be a keen rock climber, but the new family has meant he had to give it up – they demand so much effort that he and Ruth do not leave each other alone with the children more then they can avoid. In particular, their autistic son needs a lot of care. He does not have many friends in the city, and a few in other places he has left. Most of the people they meet socially are Ruth's friends.

He has three computers,(the children have one of his old computers), three phone lines, a mobile phone, and a great deal of advanced software for his work. He is very confident with computers, and does a great deal of research into developments. He uses e-mail for work and for his family and friends, and sends e-mails and types for his wife too.

A2.3.4 Joe and Daniel

Joe and Daniel are 7 and 5 years old respectively. They are both at school. Daniel has an autistic twin brother. They also have a nanny to look after them. They are both keen uses of the computer that their grandfather had given them, playing games all the time, with each other, watching each other and with friends. They enjoy watching TV, but their parents do not let them watch much. Joe is very talkative while his brother is more contemplative. Daniel loves to use the computer and is more adept. He can get past the child protection software his father installed on the PC without any problem.

A2.3.5 John

John had worked as a quality engineer in a local manufacturing company, and was currently finishing a degree in literature with the open university at the time of the interviews. He is very interested in new developments in technology and society, and even wrote a short essay for the first interview! He is involved in local science and history groups, including running mailing lists for them on his computer.

He was born near where he lives, as was his wife. He trained on the job and worked for the same firm for 42 years. He has an engineer's love of learning, experimenting, and knowing how things work. He was seen as a bit odd at work for wanting to type his own reports. During his working life he studied and took exams in literature and history, and when he retired he had time to do a degree. His daughter Ruth said that he was very envious that she had a chance to go to University, and she encouraged he to do the same when he retired. John also took courses in woodwork and in word processing, but was thrown off the word processing course because there were women who

wanted to do it and they were given priority! He has to use the video recorder, cassette recorder, word processor and TV for his current studies. He works several hours a day on his studies, but since he is retired, his studies always take second place to his wife. He has few friends, but many colleagues and acquaintances though the various social group he is in. He does not communicate with his daughters very well, and does not really understand what they do.

John does work around the house, such as ironing every thing. He likes to fix things around the house, and helps his neighbours, but he feels he is making it up as he goes along most of the time. His wife plans the grocery shopping, but he buys hardware, and is a member of a mail order book club to save money. He reads the newspapers, but relies mainly on the TV for news. He and his wife also enjoy science fiction shows.

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A2.3.6 Dorothy

Dorothy retired after working many years as a secretary in a hospital and then for a local surgeon. She was able to combine this work with bringing up two children. Her father was a railway signalman in central City, where she grew up and met John. She has an older brother living England who is a computer fanatic. Since she retired she has increase the amount of voluntary work she does, including giving tours around art and historical museums, and arranging events with a local symphony orchestra. She and John and keen theatre and concert attendees – although they stopped going to one theatre when the productions got to ‘earthy’! She does not have many close friends but has acquaintances from her activities. Unfortunately she finds they are slowing dying off.

She does most of the shopping, cooking and cleaning, and looks after the garden, which she enjoys, unlike John. She prefers to go to small shops, nut since they are closing down she has to go to the supermarket. She is also getting one over by less traditional food and buying more prepared food. She

buys clothes from catalogues and she enjoys going to charity shops. However she always buys things too small. She gets things from her family too. Although she shares money with her husband, she has always had an account for herself to spend on what she likes. She does not like to use ICTs for various reasons. She cannot remember her PIN number for the cash card, but much prefers to go into the bank anyway to chat. However she can use technologies that 'are important' to her such as the vacuum cleaner. She had to struggle with the microwave for a long time to get it to work, but loves her new food processor. Her friends from the church are not at all interested in things like the microwave though, so she cannot discuss it with them or get help. She and John share responsibility for new gadgets – he is very interested and finds out about them, and she then likes to use them!

She enjoys the television, but feels guilty about watching in the morning. Much of the time she watches what she wants when John is studying, but when watching together John controls the remote control so he can set the volume for his poor hearing. She remembers buying her first TV when her daughter's teacher told them to watch a particular programme for school work and she was the only one without a TV. Then she realised they had to keep up with the community adopting the technology. They have teletext on the television, but she never uses it – she is interested in the cooking programmes, but has so many cookery books she is not interested in looking up more recipes on-line.

She reads the paper – the most important part is the list of births and deaths, and listings of local events. She buys and swaps women's' magazines with a friend. The newspaper is a medium she trusts, unlike the computer, which she can not be bothered with. However she thinks that it is essential for the younger generation.

A2.3.7 Maura

Maura works in the same college as Ruth, who is her direct manager. She works full time providing support to students with their studies. In particular,

she deals with adults returning to college, many with learning problems, principally dyslexia. So important is dyslexia that she started a Med degree specialising in dyslexia. She has also recently completed the Certificate and Diploma in Specific Learning Difficulties too, so she is constantly studying and learning. She grew up in England and did a degree in history and German and wanted to be a costume restorer. To get away from a failed romance she came to Scotland and ended up studying to be to a teacher and then worked her way though different types of schools to the further education college. She has a fair degree of autonomy at work, with her own office, and computers. She works alongside specialists in different sensory impairments. She sees students whenever they need her advice, and helps them with their work. She also keeps in contact with colleagues at other colleges. Like everyone in the sector, there is considerable pressure of cuts in funding, and increasing informatisation of the job, much of it based on computer systems that are not entirely reliable.

She is married with two teenage children. Her husband is an ex-radio officer in the merchant navy who works in a residential childrens' home. Her children are mad on sport. She and her husband smoke and like to eat chips, while her children only like healthy food, and make them watch TV in separate room. Her husband and children have a Playstation they use – her husband said the kids wanted it but he uses it most. She finds it too fast for her reactions though.

Work study and family take up almost all her time. She does not do home things at work, but is obliged to take work home – especially reading and essays. At home her husband cooks, and she does the washing, and they pay a cleaner. She does shopping in the supermarket, where she has a routine for remembering everything rather than a shopping list. He husband hates the supermarket and only goes to small shops. She does not use mail order, but her husband does. She and her husband have separate bank accounts, she is very organised, he is not. She watches the TV and gets a paper delivered to home, but is not very good at remembering to watch

things she videos off the TV. She uses the newspaper and word of mouth for information on local events.

Her closest friend is a teacher in Beverley Hills, LA, who she communicates with by occasional phone calls. She also gets to find out about teaching issues in the US. She phones her parents regularly and keeps in touch with her brother, one of whom is a senior lawyer in a major company, and the other runs a travel, which comes in handy for booking holidays and legal advice. The street they live in is very friendly, and people drop into each other's houses very frequently. She does not use the phone much, she feels that she was brought up to have only short conversations on the phone. The phone always rings for her children so she just leaves it to them. She also relies on them to set the video and turn on the music system.

She has a computer at work, which she managed to get without being allocated one, and after a few years of using it demanded a new machine with network connection from the head of department, and got it. She had a machine at home for work –an old Mac that she knew her children could not play games on, but by the second interview had replaced it with a more up to date model, although still second hand. Her husband hates computers especially if they can't play games,, and at the first interview so did the children, because they associated them with work and school. With the new PC they are much more enthusiastic about using it! She likes computers because they help her to write. At the first interview she did not use the Internet, and thought it unlikely she would get a connection and e-mail, but by the second interview she was an enthusiastic user, and doing the European computer 'driving licence' exams.

A2.3.8 Mary

When I first interviewed Mary she had just had a baby with her husband Terry. They live in a new small house they had recently bought in an estate outside the city. She had just gone back to work after having the baby. She was a part-time teacher in a special primary school for disruptive boys, but

on a short term contracts – a job she lost during the research period. She then applied for jobs in primary schools. She is a long term friend of Ruth from college, and the same age. She grew up near the city, where her father worked in the shipyard. She then went to University and teacher training college, becoming an English teacher. She worked in Scotland 10 years, then in Australia, Spain and Portugal. On returning to the City she struggled to get a job, ending up in a special school with a very hard job, before switching to the primary school. She had many problems with the school and eventually her contract was not renewed. Applying for new jobs was very hard – especially when she was told that she would have to learn how to use computers to get a job, something she had always resisted.

The commitment of having a family does not bother her as she is very happy to spend time at home read, one of her many interests. She is in a reading club that meets monthly to discuss the books. She sees her friends a great deal, and does voluntary work too visiting an old peoples home. She visits Ruth every week, does dance and exercise classes, swimming, and helps organise events for the local residents. These are all activities that she can fit into her life. She has had many hobbies, and is always looking for new things to learn and do. She likes to draw a firm line between home and work, which her job allowed her to do successfully.

At home she does the shopping and her husband does the cooking, although he likes to buy particular ingredients. Since being on maternity leave she has also taken many other responsibilities too, which they are having to share again. She shops in local supermarkets – she sees no value in spending time travelling further to shop like her husband.

A2.3.9 Terry

Terry is older than his wife, in his 40s. he is a manager at a commercial biological testing laboratory, running one of the departments. He has been responsible for developing the business, including the introduction on

automated testing machines and the computerisation of functions his department.

A2.4 Group 4 Introduction

A2.4.1 Introduction

In looking for the final group I noted that most of the people I was already asking were in their 40s and in reasonably comfortable professional jobs. I want to find some contrasting people, especially a group of younger respondents. I had been doing some research in a publicly funded cybercafe in a relatively new public housing project, and this gave the opportunity to recruit a main respondent. I asked two boys in their late teens who were in the café and filled out a questionnaire for me, if they would like to help. Initial I interviewed Ross, who was age 19, and unemployed. He lived with his father, Bob, who had brought up him and his sister after separating from their mother (who lived near by). His father Bob was an electronics enthusiast as well as being a full time father and basket ball coach. I then interviewed one of Ross's friends, Aiden, who was the same age, and lived in a nearby flat. He and Ross had been friends all their lives and were in and out of each other's homes all the time. Neither Ross nor Aiden were interested in the free local Internet access, but Bob was. Unfortunately I found it very difficult to pin down interviews with this group, and Aiden's family and friends declined to be interviewed, so the group is limited to only three people.

A2.4.2 Ross

I met Ross in his local cybercafe when I was conducting some research there. Ross was 19, had recently left school after doing his Highers. He lived with his father Bob in a flat he had lived in most of his life. Most of his friends had gone to University, but he had decided not to go, at least for a year. Like his father he was keen on [a sport], and played for the local side that his father coached, going to practices and matches several times a week. Ross's team played in a national league and he had also travelled abroad to play.. His other interests at home were playing video games, playing role playing board games and learning to play guitar. He had bought a guitar from his cousin recently. During the interview time he had been unemployed and

done various menial jobs, such as making sandwiches. He had a girlfriend who was at [a] university, and was thinking about trying to go there, but was in no hurry to make up his mind. He had two best friends, including Aiden. They played together at each others houses in the same way they had done most of their lives. Their main interests were the computers and video games they owned, swopped and played against each other. They also enjoyed reading popular science magazines, and were very keen on all new and future technology. Ross had learnt about computers and other ICTs technologies for media and music at school, and rather missed not having the facilities. He occasionally went to the cybercafe to send e-mails, but did not like all the children in playing on the internet, and preferred to phone his friends, even if they lived abroad. He was not so interested in actually using the Internet as it currently exists.

A2.4.3 Aiden

Aiden had been Ross's friend and neighbour in the same block of flats for most of their lives. He was the same age, although he had attended a different High School. He lived with his parents and his younger brother. Many of his interests were similar to Ross, although he did not play basketball. He like to draw, especially images inspired by 'Manga' comics, of which he had a collection in his bedroom. His bedroom was very much his own space within the house – with a huge TV, books, video game consoles, and cable TV connection. He would regularly spend all day and most of the night in his room watching TV. He did various part time jobs, and did not seem to have any idea of what he wanted to do. He had a girlfriend (at the time of the second interview). His father worked as a cleaner in the local University, and had been involved in teaching canoeing and other activities.

A2.4.4 Bob

Bob is Ross's father. He is in his 40s, and at the time of the first interview he was doing a degree in Electronics at the local University. He had separated from his wife yearas before and brought up Ross and his daughter in his council flat, supporting himself with odd jobs, mostly in electronics. He owned

a computer and used it to control circuits he built, experience that was giving him to opportunity to find better paid work, especially now he had time to work as his children had grown up. He looked after the home, and still cooked for his son. He was a keen basketball player, and had moved into coaching one of the leading amateur teams in Scotland. He helped his friends and his ex-wife with their use of computers, but was getting fed up with doing people favours that cost him time and money. By the second interview he had not been able to complete the final exams for his degree course, and was wondering whether to bother finishing. His expected contract to do work for an oil firm was also looking like it might not work.

Appendix 3 Life Course

While age has been a variable traditional used in demographic analysis, more recently the idea of the life course or life cycle has been developed. This reflects not the number of years passed in a persons life, but the major states and transitions of their maturity, family and working lives. During the life course there are changes in activities, interests, resources and commitments that have a profound effect on the exposure to new technical innovation, and the need and desire to communicate and engage with information. Life course literature in sociology (Cohen, 1987), and studies from consumer research (Wilkes, 1995) can provide guidance on understanding how an individual's stage in the life course may be relevant to the current issue.

Life course emphasises the dynamic of people's circumstances, showing that the individual does not have a fixed social or occupational identity but goes through some major changes over time. Life course analysis concentrates on the major personal factors that dominate a person's life at a particular time. It also stresses that previous experiences shape every life stage, but not in a deterministic way. For example, a person's earnings during working life can have a significant impact on their level of income in retirement, but does not determine their lifestyle or interests.

Over time there are changes in living arrangement, formal status changes, responsibilities and relationships Not everyone follows the same life course, or goes through different stages at the same time, however there are some basic patterns. There are an increasing diversity of experiences as well. Life cycle is a terms that has been used more traditionally to express a linear and consistent model of the life course (Wilkes, 1995). However with the recognition that there are many different ways for life to unfold, the term life course is preferred by some (Cohen, 1987).

There is empirical evidence for how the life course affects consumption, and especially the role of transitions or life events in precipitating consumption of particular products. For example the transition from being single to having a family involves a considerable change in spending, especially a reduction in entertainment. Different life stages are also associated with particular products, for example home improvement spending occurs at the beginning and the end of family life. There are also difference between life stage consumption depending on when they occur. People that delay starting a family tend to have more money, and spending on furniture for example goes up when they start a family, compared to early starters where it goes down. course (Wilkes, 1995). The use of media technologies reflects the life probably more than any other factor.

We can summarise some of the broad issues relevant to different life stages (Cohen, 1987; Wilkes, 1995; Gournay and Mercier, 1998):

Youth is dominated by education and leisure time, but with limited control over resources, and limited knowledge and experience. Building social networks and establishing activities and identity are important, and these involve high levels consumption of media and cultural goods (which today includes many ICTs)

Early adulthood is often a time of exploration, of building social networks, and discovering core values (although these will be shaped by childhood experiences). Activities such as leisure and social entertainment are important. Active sports, interest in new fashions -clothes, media, music etc. It is also often a period of low responsibility.

With *adulthood* comes busier life, more focused on working, and goals to do with careers, and consolidation of social network. Setting up a family is another major commitment, reducing time and money available for interests of youth. However the transition to responsible adult with commitments can vary enormously, some people have a family before they can develop career

and work experience, others never manage to work, other never have a family etc.

Increasingly common is divorce and major career change or ending in mid life.

With age commitments to family can end, and expectations and goals for career development may tail off. However this can be a peak time for productivity and a time for increased social activity.

With *retirement* work responsibilities end, and income can drop. Time now becomes available to pursue activities previously restricted. For a time mobility and freedom are increased, and there are opportunities for self-development. Many may also take this opportunity to stop 'self-development' and enjoy not having to do or learn anything new. There may however be increasing calls to support the family.

Alternative domains of life can domain life stages and alter life course. Family can be an important factor during one stage, while at another, career development or unemployment can be defining factors. Life course tends to be related to family status, but to stick to the model of cross over of career. Employment trajectory, and particularly income is very important in influencing activities within a lifestage, and expectations of future life stages (such as early retirement, expectations of increased earnings or fear of unemployment)

There is also a danger of focusing on the life course of an individual, rather than looking at that life course in the context of community, or social group. This is obvious with the family: a couple can be at very different stages in their life, with one dominating the activities of the family. The age of children compared to parents can have considerable effect. The network of friends and their activities and interests can also have a considerable impact on how a particular life stage is lived. Gender is another important factor, with important differences between men and women., again centred on family life stages, but also on the expectation of family in early life, and the effects of

motherhood on later life stages. The move to family life stages often has a more important effect on women than men. Traditionally the life cycle of a family has been measured according to the age of the man, but analysis according to the age of the women is more common.

A3.1 ICTs and the life course

There are a number of important issues relating life course to ICTs.

A3.1.1 Absolute factors

The life course of individuals and groups studied today runs parallel to the innovation and diffusion of new technology. The oldest people adopted the telephone and radio in their youth, those in their 70s had television when their families where young. They also lived through the 'Computer Age' and the computerisation at work in the 1970s, when computers meant 'boffins'. Home computers and video games only appeared in the childhood of those under 30, a generation that grew up with the video recorder, cash machine, music synthesiser and the office PC, innovations devised, paid for, and implemented by their parent's generation. Today's children have the Internet, mobile phones, and MP3 s.

Therefore age is a key factor, purely due the development of ICTs over time. Older people will not have had computer training and experience at school or at formative stages of working life, where as many younger people will have this experience. Age is also a factor relating to the expectation that ICTs will be important for future activities, such as employment. Older people will also remember technologies superseded by time, of alternative ways of doing things, and debates and problems surrounding previous generations of innovation, as well as appreciating the benefits of many new technologies.

A3.1.2 Activity Factors

Again on the first instance related to age, but compounded by other factors. Teenagers and younger people are still focused on forming social networks, are more influenced by peer pressure and media, as shown in many types of studies. The telephone, e-mail and chat systems are popular. This stage often coincides with formal education, where today computer skills are taught in all schools and higher education, and expectations of needing computer skills in the workplace are very high. Personal boundaries are less important.

With responsibility and productivity at work, and the need to manage personal life whether it includes family or not, ICTs continue to play an important role, but in a different way. There is generally less time to learn, and there will be big variations in access and resources to support learning and use depending on employment and income. Depending on profession and home life boundaries can become more important, putting time and space between these activities. Certain ICTs can become heavily associated with work (telephone, computer) and kept to this sphere of life(Gournay and Mercier, 1998).

With responsibility for older children, this can change, and the need to satisfy their demand, or need for educational and entertainment ICT brings these into the home, and the need to manage their use in the family. A study of ICTs and life stages[PAT_15, 2000 #354] showed that households with older children tend to have much more money that those with younger children (and also the increasingly common ‘late starter’ households): there is more money to adopt ICTs in the home.

With the development and spread of ICTs into most areas of work, older people have to deal with learning and adopting ICTs as part of their established activities, or maybe as a way of making a mid-life change in employment activities or opportunities. The way that ICTs are appropriated at this life stage will be different to that of a much younger or older person.

There are other life stages that are important to consider, and some of these are becoming more common. These include single persons, or childless couples who by mid-life have a comfortable income, and more time to spend on learning and using electronic media. They may also be able to have a social lifestyle that is more like a younger person: more mobile and flexible. Single parenthood, and older divorced single people are also growing groups. Again, single parents normally find themselves with lower income, less time, and more constraints on activities and relationships. This provides pressures and limitations for adoption or use of ICTs to manage new circumstances. For many single parents this is only a temporary stage before forming a new family, which is also a point to take on board new ICTs. Older single people have to face many changes in their social life, but also many new opportunities to change activities and make new relationships, that involve new ICTs.

Older people, at the end of family or working life have the opportunity to avoid the adoption of ICTs for work, or within the family, but also the opportunity to learn and use them. Entertainment technologies are evolving fast, and may have to be adopted, and with younger families moving away and adopting ICTs they can find themselves relying more and more on communications technologies. Also, for older people involved closely with younger generations, they may find themselves having to deal with grandchildren using ICTs, and participating in the lives of their families as they appropriate new ICTs at home and work. At the later life stages there are more an more opportunities to explore and innovate, and self development is becoming an increasing ‘popular’ activity for older people.

Key factors throughout the life cycle that include ICT use and adoption include income, social network, mobility (how much travel and peripatetic working and socialising) and flexibility of lifestyle, management of time and relationships at home and work, boundaries of life domains, and meanings associated with ICTs. Pressures of time and commitments influence the use of media technology, flexibility of time influence information and

communication technology use, as does mobility. Looking at gender, the increased pressure on women to maintain family and employment opens up a space for the adoption of ICTs, but also reduces the time and motivation to adopt anything that may not be a direct benefit.

The effects of previous life stages and experiences on current stages is an important issues. Again, age, and the introduction of new ICTs at different ages and during different life stages is very important. Previous experience, forming skills and attitudes during an earlier life stage provides the basis for adoption, use or divestment in subsequent stages. Early employment in an industry or job where computer were used can be important in providing skills and confidence to use them later in life.

Understanding the material of this study is be greatly enhanced by reflecting on the life course and different life stages. The respondents in this come from a variety of different life stages, with very different life courses. Life events, and turning points between life stages were an important part of the original research proposal, and are incorporated into the methodology. This is rather different to looking at how life stages influence attitudes and adoption of ICTs.

Appendix 4 Empirical Life: more specific models and findings focused on ICTs

A4.1 Types of users, Types of applications,

Can we say anything about particular types of people and their relationship with technology, their opportunities to adopt, there preference for particular applications?

Do some people like or need to communicate more? Do some people need information and control of info. Do some people have busy lives and need flexible communications and info access? Do some people not need or want this, and try to minimise communications and information use. Do some people draw boundaries between different part of their lives in which they have different ICT related activities. Do some people search for new solutions, do some people like to experiment with new things, are they naturally curious; have some people had experiences that make them more open to, or confident with particular innovations? Do some people have the resources to be explorative?

Are some people afraid of technology. Are some people afraid of change. A range of interrelated research and theorising can provide the basis for understanding who a user is, who they stand in relation to their community, and who and why they may adopt or consumer innovations, in this case new ICTs and multimedia.

A4.2 Life form

Qvortrup uses the idea of Life form as introduced by Højrup (1983,1984) and applied to it by Storgaard and Jensen (1991) This has some links to the ideas of lifestyle outlined earlier, but applied in the context of ICTs and the linking of home and work, especially in telework. This brings us back to the idea of boundaries introduced earlier.

They categorise 3 life forms
Self employed person – seeks independence, few boundaries between home and work

Wage earner – seeks leisure time, strong boundary between home and work

Career oriented - the work and job is central to their life, work everywhere

This is revealed in three meaning of telework, that shape technology differently:

- Electronic home work – independence to work at home. Cottage industry
- Telecommuting – technology saves time in commuting, more flexible lifestyle

Flexi-work – ability to work everywhere

This type of analysis can be used as a way of linking lifestyle and the used of new technology more closely.

A4.3 The IT for All survey

The IT for All survey is a series of investigations into attitudes and uses of ICTs in the UK sponsored by the DTI. It has been running every year since 1996. This study groups the population into five categories derived from a survey of attitudes and behaviour towards ICTs, but not necessarily on their overall usage. These are very similar to the CAUTIC categories discussed earlier.: *Enthusiasts, Acceptors, Unconvinced, Concerned, Alienated*. What this longitudinal survey has been able to do it track changes in the population over time, seeing reduction in the number of 'concerned' and 'unconvinced'. Thus it tracks the diffusion of attitudes and behaviour in a community, rather than actual adoption of products and services (these figures are given in a later section) from the actual product. The Alienated and the Concerned are the lowest users of ICTs, have the least interest, the most 'negative' attitudes and the lowest experience. Compared to other groups they are mostly older and poorer. However, within this framework, many of the most 'enthusiastic' 18% of the survey group still do not adopt many technologies: 59% used a PC, 56% a mobile phone, 43% a CD-ROM and 25% the Internet. Whatever

the experience, resources, knowledge and attitude there is still a considerable dimension of non-adoption and non-use that is not explained.

A4.4 Media Users – BBC Web model

From research done by the BBC in the development of their on-line services, they identified a number of different groups of users that they could serve through their Web site. The categories they identify are based on the relationship someone has with a media product, rather than a characteristic of a particular individual. An individual be covered by all of the categories, and different products could also fall in to multiple categories. They are not absolute content types either, but constructed media products[1].

The first category they identify is the 'information junkie', a category I recognise well from personal experience and through the literature and field work. The information junkie has a habit that the content provider can feed – lots of information, multiple sources, ever changing. This group of people, of which I am probably one, loves to find out new things, and appears to consume information for its own sake- through books, the TV, radio, the Internet, newspaper, anything. Since much information is in text form these people may prioritise text over other less 'information intensive' media forms such as TV. Some people have professional commitments to using information, but their use and engagement with it goes beyond a purely instrument limited search. Maybe these people are trying to reduce uncertainly in decision making, maybe they are obsessive about knowing about the world, and, in particular, about the changing world. In the business of new ICT, with the constant change and it emphasis on information as the primary commodity, the information junkie is particularly at home. Does this business attract information junkies?

[1] This research was presented by a representative of BBC INTERACTIVE at Milia 98, Cannes, Feb 1998

The second category is about obsession as well, but not a general obsession with ‘information’, but an obsessive behaviour around a particular media product – such as a soap opera, or other cult series or media personality - fan behaviour. Cult followers and fan-atics, will consume, exchange and talk about their particular obsession constantly. For the producer, in this case the BBC, they are able to feed this obsession, creating new complementary products and services related to the product. However this is more than a consumption practice, the obsessive invests meaning in the product far above what might seem ‘normal’. They appropriate the product and often become creations and producers themselves, creating a subculture and products and events to strength and sustain a culture and community. One of the most celebrated media cults particularly associated with the community of younger males who dominated computer user community in their early days, is Star trek and the ‘trekkies’. We could also include under this category, football fans, since football has become a media product. Members of these groups appropriate anything that can be used too feed their obsession, and communications and media technologies are immediate seized upon. Production of fan sites and participation in, news groups, and mailing lists are certainly one of the major drivers behind the growth of the WWW and Internet, and fan pages make up a huge number of the sites on the Internet (what to non-fans appears to be ‘rubbish’ or ‘trash’ but is arguably the major strength and interest of the Web. Often the sites make illegal use of copyright material, and their appearance has created problems for the owners, who are not sure whether to try and close them down, or accept that the value of their product is so high because of fan behaviour, and attempts to control it would be like shooting themselves in the foot.)

It would not seem unreasonable to extend this thinking to a wide variety of activities that people invest themselves in, and derive meaning not only from consumption of a product, but from participation in the community, and in production or performance. Many hobbies can be included in this category. New media products and technologies become relevant when they can be

appropriated by members of these communities in support of their activities. Again, huge numbers of web sites exist, produced by volunteers, to support, demonstrate or promote their activity. Some support existing communities – others can bring together individuals and local groups into global communities of interest. Some have managed to become commercial due to the size of interest. Commercial media producers call all try and cash in on these activities, appropriating expertise and using it to create products for these markets. In the UK every fish has a magazine, to fed the interest of the millions of amateur anglers, the Web can be used to extend this to almost any activity or product, however small or dispersed the community.

If someone is a fan, or engages in a hobby of some sort, in which communication and information are important parts of the activity, then this could act as a trigger to adopt or use and create new media products. These activities are a sort of 'over-consumption' an *engagement* that takes the normal consumption and meaning making beyond 'rational' behaviour.

It need not be restricted to leisure activities. Some people are lucky enough to do a job that has an obsessional element, an activity that they are highly engaged in, and their obsession maybe allows them to excel in that activity. Information junkies can thrive in work that requires information processing and explicit knowledge development around information gathering and production.

An obsession can also be an important factor in crossing boundaries. People may draw boundaries around work and home but fan activity can cross these. A computer hobbyist or course, can often work in computers and spend time at home working on computers. A football fan can follow matches at home, and discuss all day at work. The development of many hobbyist and fan web sites was lead through access to the Internet at universities, with people using work or college computers and time to generate personal web pages and take part in on-line communities through e-mail and newsgroups.

As well as these obsessive groups, the BBC researchers identified a number of other categories of user-information. One is 'the passions', and the desire of most people to satisfy passions. For the broadcaster, this involves providing documentaries and films, but also satisfying greed. Beautiful or unusual images, sounds, and fascination at the natural and social world are passions that media can feed, whether systems like the Internet can do this at the moment is questionable, but certainly the fascination of exploring the WWW and of discovery of peoples and knowledge could be an important use. Greed, targeted by gaming and gambling, for example, is another intense area of development of media products, and is a perennial factor in many people's lives.

Another is education and self improvement. Rich educational products: a remit of the public broadcast has been to provide educational material, and the Web and on-line environment offers then an opportunity to expand this considerably. This application is also one of the dominant areas of rhetoric and experimentation in multimedia. Education is certainly an important part of most people's lives, at school and college, but also increasingly though life (life long learning). Active engagement in education and learning could thus be seen as an important factor in the adoption and use of ICTs.

This type of evidence for the way that people actually engage with ICT media products gets us away from a focus on the physical product and away from proxy factors linked to 'life style'.

A4.5 Media Mix research

(Livingstone and Bovill, 1999) studied the place of new and traditional media in everyday life at the end of the 1990s derived a classification of different *styles* of media use that people generated themselves as they mixed new and traditional media.

Screen entertainment fans – who spend considerably more than average time watching TV and videos, playing computer games, and little time with books.

Specialists, who spend more than average time with one particular medium – book lovers, PC fans and music lovers.

Traditionalists, who spend most of their time with traditional media (TV, radio, books, magazines), and little with PC or computer games.

Low media users – who spend below average times with any media.

They find that television still dominates media use, although not much ahead of music listening, and is the medium that is recognised for its content, rather than as a technical artefact. More recent media, with poorer, or less diverse content is seen as glamorous, but lacking in interesting content. However one IT medium that is important for younger children is the games machine, which is often referred to as a computer. With older people the computer seen as being more important in terms of work rather than play.

They also looked at the telephone, which they found was not regards as a leisure technology, but was regarded as a recreational technology.

Appendix 5 Analysis Categories

Adoption method

(F 23) adoption
(F 34) adoption/non-use
(F 26) borrowing
(F 75) buy from family
(F 29) gift
(F 27) inheriting
(F 4) non adoption
(F 67) refusal
(F 35) reliance on others
(F 32) vicarious use
(F 36) partner/friends buys
(F 112) computer from work
(F 115) imposed adoption
(F 120) share in family

Adoption reason

(F 51) engagement with technology
(F 25) trigger
(F 6) pressure to adopt
(F 24) tech changes
(F 39) plan life changes
(F 89) submission
(F 122) technical compatability problems
(F 49) frustration with limits
(F 131) curiosity

non adoption

(F 4) non adoption
(F 60) can't be bothered
(F 67) refusal
(F 28) tech turn off
(F 54) financial limits
(F 68) fear of tech
(F 63) ignorance of new tech/service
(F 92) reluctance
(F 114) resistance
(F 118) uncertainty over tech development
(F 123) no need
(F 125) avoidance of technology
(F 129) feature non-use
(F 130) situation non-use
(F 128) privacy issue
(F 132) not got round to it
(F 133) tech in charge
(F 151) exclusion

adoption process

(F 16) computer training
(F 56) experimenting
(F 30) disappointment
(F 61) learning process
(F 17) learning time
(F 5) stopped using
(F 43) media information
(F 64) incorporation
(F 16) computer training
(F 127) divestment
(F 144) stop consuming
(F 134) reduction in use
(F 148) bad customer service

use

(F 56) experimenting
(F 3) Web research
(F 59) computer for voluntary work
(F 73) computers at school
(F 8) phone use
(F 85) control
(F 121) product design
(F 58) children and computers

use process

(F 35) reliance on others
(F 32) vicarious use
(F 19) chronic problems
(F 51) engagement with technology
(F 56) experimenting
(F 7) tech attachment
(F 9) technical confidence
(F 50) self help
(F 88) tech as tool
(F 101) innovative
(F 124) computer makes work better

limits

(F 70) age
(F 48) boundary
(F 19) chronic problems
(F 72) closedness
(F 49) frustration with limits
(F 54) financial limits
(F 68) fear of tech
(F 17) learning time
(F 71) openness
(F 149) over use
(F 63) ignorance of new tech/service
(F 69) overwhelming
(F 31) system distrust
(F 86) information access
(F 113) skills lack
(F 117) technical limits
(F 118) uncertainty over tech development
(F 122) technical compatability problems
(F 133) tech in charge

events and change

(F 21) change in attitude
(F 37) tech events
(F 19) chronic problems
(F 22) major life events
(F 24) tech changes
(F 39) plan life changes
(F 38) work changes

social network

(F 57) disagreements over tech
(F 18) local expert
(F 14) Internet community
(F 15) tech community
(F 77) friend helps repair
(F 84) tech in relationship
(F 80) control of use
(F 79) other uses tech regularly
(F 58) children and computers
(F 87) wide area network
(F 93) family
(F 94) friends
(F 95) colleagues
(F 96) acquaintances
(F 103) partner
(F 140) information exchange
(F 152) community organisation

other resources

(F 43) media information
(F 41) past computer experience
(F 62) past experience
(F 52) technical information
(F 139) magazines

Crossovers and boundaries

(F 47) crossover
(F 10) technical crossover
(F 108) home at work
(F 109) telework
(F 104) home-work boundary
(F 105) home based work

actual technologies and services mentioned

(F 137) Internet
(F 16) computer training
(F 73) computers at school
(F 5 3) computer at home
(F 2) digital photography
(F 59) computer for voluntary work
(F 8) phone use
(F 1) read newspaper on-line
(F 12) satellite TV
(F 55) payment systems
(F 11) video
(F 3) Web research
(F 45) television
(F 99) non media tech
(F 100) photography
(F 116) digital TV
(F 119) computers in education
(F 137) Internet
(F 153) teletext
(F 147) mobile phone
(F 136) radio

places of use

(F 73) computers at school
(F 33) tech in locality

(F 13) computer use at work
(F 98) computer at work

Activities

(F 40) information demands
(F 74) information searching
(F 76) shopping
(F 46) work at home
(F 82) local news
(F 78) mail order
(F 66) money
(F 65) news
(F 81) newspaper
(F 44) travel
(F 102) reading
(F 106) life long learning
(F 97) remoteness
(F 111) other activities at work
(F 121) product design
(F 126) communication
(F 139) magazines
(F 135) entertainment genres
(F 138) listings
(F 141) theatre/cinema etc

general behaviour/attitudes

(F 50) self help
(F 51) engagement with technology
(F 51 83) engagement with technology/attraction to tech
(F 20) expectations
(F 56) experimenting
(F 49) frustration with limits
(F 64) incorporation
(F 42) Internet evaluation
(F 110) flexibility
(F 128) privacy issue
(F 107) sector change

(F 90) tech identified with system

Appendix 6 Preparative Work: Self-investigation

An early social network research experiment was to keep a diary of one's own social contacts. I did this for two weeks, noting who I met, when and where, and the nature of the encounter (including e-mail and telephone). From this I will able to built up a picture of my own social network, and the range and nature of contacts I was having. Those I met most frequently were those I lived with and worked or studied with every day. Then there were a group of people that I met regularly linked to common pursuit of particular interests. However the relationships I had with these people varied widely – some I saw everyday, but did not even know their name, such as shop keepers, with some I had contact but based around a very limited set of activities and exchanges. Others of course I had much richer relationships with. On top of these contacts were less frequent contacts with a range of people, some I knew very well, others very little, sometime I wondered why I knew them at all! This experiment said a great deal about my particular activities and circumstances, but also showed that the social network is very heterogeneous, with many different types of relationships, and different types of contact. Some encounters are based on place, some on friendship, some on work, some on specific activities. Not everyone I interacted I wanted to meet. I realised that it would be very hard to ask someone in a short interview about their everyday social network – it is easy to recall those one has a strong relationship with, but others are more difficult to recall. Only by prompting to particular events and activities would it be possible to start a discussion about those relationships. It also raise in a practical way the methodological difficulty of selecting what part of a person's social network to study.

Another self-study I did was on the adoption process, which I did around the time I bought a mobile phone. In this study I wanted to cover all the issues I wanted to cover with the respondents in the interviews. I attempted to keep a diary of my activities and thoughts around this adoption process, and also

those of my social network as they saw me adopt. I documented reasons why I become interested in buying the phone, and my feelings about it, particularly the conflict between two instincts – one that desired the telephone, and one that felt is was unnecessary waste of money. Around these I realised I was constructing a set of rational arguments, sometimes on quite flimsy ground. The instincts related to the highly symbolic nature of the technology, and my self image as a non-users in a group of non-users, but with a certain attraction to a 'reference group' of adopters. As well as issues of identity in relation to specific others, their was also the direct attraction of the technology itself, something that I had studied, and read about – there was a great deal of curiosity about how it worked. There was also an issue of ownership, it somehow represented my ability to be a consumer of this advanced technology and service, of the potential benefits of owning it and enjoying being a user and owner.

The issues about how it might be used, and how useful it might be were not primary, but constructed to justify it. They did however provide the penultimate trigger to justifying the purchase: I had finished a project that at phone would have been very useful for, and was considering embarking on another similar one. It would also be a sort of reward for the completion of the project, and a badge of imagined status!

The period running up to the actual adoption had also involved developing knowledge about the product – studying prices, models etc. Unfortunately I did not know other users at the time, at least not for everyday contact, so I was rather by myself. However I had a experience of this sort of purchase, and have the mentality to actually enjoy the research. Before the purchase I was going through a process of mental appropriation – including mental experiments, imagining uses, benefits and costs, so that by the time I made the purchase. This process involved ambivalence and uncertainty, dealing with the attraction of the technology, and to the image of owning and using it, contrasted with apprehension over opinion of many members of everyday

network with the expectations that they would not approve and the practical risk of investment and expense.

The actual adoption was rather a snap decision in a shop trying to find out more information. The decision to make the purchase was not followed by a cooling off period, or arrived at by careful rational decision making. The purchase/decision introduce a strange mixer of elation and instant regret (since it involved a 1 year contract), it was as if the decision had been taken for me by making the purchase.

The post purchase appropriation, or implementation involved many of the issues I had imagined coming home to roost, and revealed a host of new issues. The response of those around me was as I predicted, full of 'yuppie' references and so on. It was also mixed with curiosity, maybe envy, possibly reinforcement or changes in their perceptions of me, something that a very visible technology like this could do. The practical issues of owning the phone I found considerably more problematic than I thought. First, I found it took control of me! I had to remember to keep it charged, and take it with me, and keep it on. I had to set the call minder service so that it would divert to the right place as I moved in and out of building where reception was poor – and unexpectedly it was very poor in the office – which meant I had to lean out the window to use it. Forgetting to take it with me caused many problems – guilt at paying so much for it each day, and then not using it, and for giving out the number, and people phoning and finding I was not there. Since my immediate social network were not used to the mobile phone, that when they could not get me, they would say what was the point in having it. It also meant I had 3 answering machines referring to each other which exacerbated the problem. At this point I realised I was not the only user of the telephone – everyone who called me was a user also, but they had not chosen it, it was forced on them. My parents, in particular, were very reluctant to call, because of the cost.

The phone also had practical problems – having to program it, find out how it worked, finding problems with reception, and the battery running out. The

phone also dialled automatically by mistake a few times, including recording a long conversation on someone's answering machines, although luckily it was the same person I had been talking to at the time in the park!

All in all it appeared to bring many more problems than it solved, and not a little regret. However certain situations and events redeemed the technology – when I was travelling it was very useful, and certain calls I received increased its perceived value no end. It also satisfied an expectation of its use to 'fix' problems of being late, and of trying to meet up with people when I was out of the house and office.

The shock of the first bill, and the second bill, was sobering, and over the year I was subscribed my feelings towards and use of the phone see-sawed dramatically. When it came to renewing the contract, I kept it, partly because I had found it useful, and managed to 'tame' or domesticated it to a certain extent, partly because I was attached to it, and did not want to feel that I had made the wrong decision to adopt by giving it up.

Over subsequent years other things changed – the mobile telephone itself became a much more common technology, as pre-pay was launched. Now I felt I was a sophisticated early adopter compared to the mass market (while I had felt a late adopter in relation to my reference groups). I also went though periods of mislaying the phone for weeks on end, and deliberately not bothering to find it, as an attempt to escape from its control which sometimes felt constricting. However the constant daily cost, and people giving up calling the phone because I never answered kept bringing me back to it. My relationship with it was never stable or harmonious. I tried to be in control of it, but felt it was controlling, whatever the benefits actually were of using it, which were many, especially when I was travelling. A period of time in a foreign city, where the phone as much more prevalent and useful reinforced its benefits, especially with the technical novelty of switching SIM cards and having two mobile numbers. Eventually the phone was lost and I had the chance to give it up or replace it. Again there were decisions to be made, the

opinions of others to be taken into account, the desirability of new technology etc. Eventually I did get a new phone, and went through the excitement of owning a new gadget phase. The new phone had a major benefits over the old one that made up for some of the problems – the batteries lasted much longer, and it was much smaller so I could carry it in my pocket, and not keep putting it down and losing it! New family commitments also introduced new reasons to have it and to use it.

This story unfolded over the time of the research, and informed it considerably. It highlighted the ambivalence of owning and using a new ICT, the uncertainty about how it could be used, the difficulty in appropriating it and controlling it, the role of the social network, as co-consumers, and as the source of conflicting attitudes and opinions. As an owner and user of the phone I also became an expert on it for others. Others would also borrow it, and rely on me to have it and use it. Also during the period of ownership my personal needs and requirements changed, and the prevalence and meaning of the phone in society in general changed. Of course, be a student of the adoption and appropriation of ICTs made me particularly aware of my own use, but did not affect it. It did make me more aware of how other people interpreted the phone, and how they were adoption and using it.

The mobile phone is a technology that is particularly used to cross between different domains life – its ‘personal’ nature, in that it is carried on the person highlights this aspect of new ICTs to be personal, and personalisable.

Appendix 7 Other roles in the network or social group

The local expert is an important member of any social group or network. There are also a number of other role that can be seen in any particular situation, which the local expert may also play. Although I will not develop the ideas of these role, they are easily identified from the research data. These members of any group facing the possible appropriation of an innovation, and indeed any stage in the evolution of technology use take relative role, and exist because the consumption and appropriation is always a collective process, situation with in a set of social and economic relationships.(moral economy in a broader sense than looking just at the home)

The Decision Maker

In any group the final decision on adoption or purchase can rest with one person. This could be because they know more, (they are the expert), because they are the 'leader' of the group, or because they control the resources (money. They can exert power to make decisions, or be handed the responsibility by others. An expert may be consulted by a decision maker, to help them make the decision, or the responsibility handed over to them to execute a decision, especially one that involves complex knowledge.

The Opinion Leader

The opinion leader in a group has strong influence over the choices, opinions and attitudes of others, shaping the appropriation of innovations. This attitude of the opinion leader towards an innovation will be reflected in their attitude and decisions.

The Money/resource holder

The Resource holder may have some power as decision maker, but not necessarily the knowledge about what to adopt or how.

The Resistor

There is often someone in a group who for what ever reason resists adopting an innovation. As we have seen there are many reasons for resisting or nor wanting to adopt. The resistor may be the voice of caution for the collective good, or have expectations that they will somehow suffer from adoption, even if others benefit. The expert can be the resistor: their expertise leads they to expect that adoption of a particular innovation may be foolish, or possibly they know that responsibility for it will fall to them.

The Enthusiast

The person who is most excited by an innovation, maybe seeing the benefits or possibilities without too much concern for problems or costs that may arise or be entailed in adoption. The Enthusiast can be an expert, trying to promote the innovation that they know about and are keen on. The enthusiast may also not know very much, instead being engaged with some superficial or uninformed expectations of adoption. The enthusiast may also have the most to gain from adoption, despite the problems faced by others.

The Technology owner

Within a network there is also the role of equipment owner: the person who has access to equipment, from work or at home. This person may have the latest gadgets, most powerful computer etc, but could equally be just the only person who has a computer, mobile phone, games machine, subscription to an on-line service etc. This person may not necessarily be a local expert, although they may have certain expertise. In the case of Aiden or Ross, they do not own computers, but they know how to use them, so the main factor in access is knowing someone who has a machine they can borrow.

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EndNotes

[1] Castells discusses the idea of information society – which he criticises as being to broad a term: information has been critical to all societies. He prefers the term 'informational' society or economy, in contrast to 'industrial' which refers to " the attribute of a specific form of social organisation in which information generation, processing, and transmission become the fundamental sources of productively and power" (Castells, 1996)

[2] I do not attempt a discussion of what 'technology' is here, although it is useful to point out that there is often a confusion between the use of the word technology to mean particular artefacts, and a more correct usage for which particular artefacts are only part of the techniques and knowledge used in activities that involve those artefacts and as the basis for the creation of the artefacts. It would be correct to say that the term sociotechnical is redundant, as technology properly understand is in part social, all activities and artefact creation occurs as part of social organisation. Whatever definition is considered 'correct', I use the word technology in a number of ways – to mean a range of 'basic' technical innovations, such as the body of knowledge and practice involved in creating integrated circuits, socio-technical systems, such as a mobile telephone network, and particular artefacts such as a video game, which refers not only to the code and algorithms, but also to the images and interactive experience.

[3] Of course this is only one part of the 'information' revolution. Some would include the development of the science and technology of genetics as being essentially based on the 'informatisation' of life (Lyotard, 1984) though the unravelling of genetic code and its processing using the most powerful computers connected around the world (Castells, 1996).

[4] And, as Rosenburg continues: "In the case of final consumer goods, the redesigning is likely to be primarily concerned with the development of product varieties suitable to the financial resources or different income goods." (Rosenberg, 1983).

[5] This discussion of consumption and domestication of ICT is based on a lecture given at the University of Edinburgh between 1996 and 2000.

[6] Fleck calls this process 'Innofusion' (Fleck, 1988).

[7] (Dant, 1999) suggests that living with things would be a more appropriate phrase for much of what we term consumption.

[8] A relatively recent, critical view (particularly from the Frankfurt school), is of the consumer mindlessly buying, using and discarding 'commodities', at the 'mercy' of large capitalist producers. The liberal view is of course that consumers are completely rational in consumption. The Utility Theory of economics is particularly poor - it sees individuals in isolation, responding to their own perceptions of their needs, with no social context. Early sociological theories of the social significance of material goods and consumption, particularly Velben's 'conspicuous consumption' of the leisured classes at the end of the 19th century, are based on consumption as a way of displaying economic worth and reflecting values and power relations in society (Velben 1899, in (Dant, 1999)). In these approaches, consumption is wasteful, as opposed to production which is active and creative, and part of the organisation and power relations of society. The limited research can also be seen as the lack of regard that sociology has had for the material world, especially in 'micro' or everyday level of social relations (Dant, 1999). Looking at other disciplines, the proper subject of economics, whether it be Marxist or Liberal, or of innovation studies, has, again, been production. Disciplines that did take consumers more seriously include rural sociology (Rogers, 1995), which looked at farmers as consumer-adopters of technical innovations, and later, 'Consumer Research', but until very recently even this managed to treat the consumer very much as the object of the systems of production

[9] One discipline that has dealt with the consumption of goods and products is cultural anthropology, which emphasises the symbolic nature of goods and their place in culture, focusing on the ritual nature of material artefacts over their practical use. Authors such as

Douglas and Isherwood argue that consumption is more than an economic process, it is the basis of culture (Douglas and Isherwood, 1979, 1996). Over the years these have been joined by two main streams of consumption research: 'economic materialist' emerging from urban sociology, and sociology of work and 'psychological-cultural' from critical theory, cultural studies and postmodernist debate. These started to come together in the 1990s (Campbell, 1995). Just as the importance of use entered technology studies, consumption has entered sociology, putting things previously considered trivial at the centre – advertising, shopping and fashion - alongside work, class, employment etc (Sulkunen, Holmwood et al., 1997). It critically engages with the issues that "not only is the economy organised round selling and promotion, but that members of society treat high levels of consumption as indicative of social success and personal happiness, and hence choose consuming as their overriding life goal" (Campbell, 1995, p.100). This links together micro-level studies of living with material goods, with more sophisticated analysis of the place of consumption in broader culture (Miller, 1995).

[10] The concept of Bricolage is used in consumption studies by a number of authors and is based on the idea introduced by anthropologist Lévi-Strauss (Lévi-Strauss, 1966). Bricolage implies the not systematised engagement with the material world, of 'making do', rather than following scientific or mythological practices. Hebdidge sees bricolage as the putting together of commodities from various locations into a new symbolic ensemble (Hebdidge, 1979), which de Certeau (De Certeau, 1984) see it as the creative adaptation of material goods and ways of doing things, but without the use of institutionalised knowledge or strategies. (It could also refer to the process of inter disciplinary research!)

[11] Bourdieu describes the 'habitus' power relations and struggles that reproduce themselves across generations, that provide basic 'conceptual categories and action frames through which people think about and respond to the social world' (Bourdieu, 1984). This is reproduced in consumption as class divisions of taste and internalised norms. Consumption is shaped by and reinforces these norms, which do not change over the generations. This becomes a rather, negative, defeatist approach, but one that attracts a great deal of attention.

[12] 'Objectification' from Hegel (Dant, 1999, p.32)

[13] Examples include 'Mods' giving new meanings to traditional clothes and other objects (Hebdidge, 1979), shopping centres used as community centres for groups of youths, and people using the military and research computer networks to send personal e-mails.

[14] Tactics are in contrast [to strategies]: " a calculated action determined by the absence of a proper locus" No determination of an exteriority, then, provides it with the condition necessary for autonomy. The space of the tactic is the space of the other. It does not have the means to keep itself at a distance. It does not have to option of planning general strategy and viewing the adversary as a whole. It takes advantage of opportunities. What it wins it cannot keep." ." (De Certeau, 1984, p.37), tactics are the "art of the weak".

[15] One way is to write the biography of the 'thing' (Kopytoff, 1986)[15]. For a computer, we could follow it from an office, sold second hand to be used in someone's home study, to their child's bedroom, then donated to a community centre and finally ending up in the back of a cupboard or as a work of art[15]. We can construct a technical biography (such as upgrades, reconfigurations), physical biography (where it is used), economic biography (how it is used to make money, and what it costs), a variety of social biographies (who uses it, in what social context and its symbolic place in those relationships). These biographies can all be culturally informed, examining the 'thing's' cultural status and meaning in context, and the meaning of transformation. For example, the computer could be a status symbol in one situation, in another, its gift, a symbol of the relationship between giver and receiver and the importance of gift giving in the local culture. This way we can see how artefacts and technologies are culturally constructed, and re-classified.

[16] 1) *Study of consumption of 'commodities 'and material culture* from sociology and anthropology, and studies of 'everyday life', (Douglas and Isherwood, 1979, 1996; Belk,

1995; Campbell, 1995; Jackson and Moores, 1995; Miller, 1995; Douglas, 1996; Fairchild, 1996; Gay, Hall et al., 1997).

2) *Gender studies*: for many the home is still the site of a very conventional social institution, the family, and feminist studies (or more generally gender studies) has been active in 'unpacking' the home to understand the gender power relationships of the home and 'private' spaces (Cockburn, 1992; Frerk and Gatzke, 1992; GRANITE, 1992; Gray, 1992; Moyal, 1992; Berg and Aune, 1993; Cockburn and Omrod, 1993; Cockburn and Fürst-Dilic, 1994; Stone, 1995; Berg, 1996; Wakeford, 1999).

3) *Teleworking:* Teleworking research comes from a variety of directions, and has often been linked to a strong vision of the 'information' society, and the liberation of work. It is often couched in terms of the public world invading the private world. Research has been carried out by those looking at work, and from gender studies (Van Rijn and Williams, 1987; Jæger and Qvortrup, 1991; Qvortrup, 1992; Castells, 1996; Qvortrup, 1999).

4) *Audience and media research:* Many domestic technologies are media technologies. Audience researchers, and those studying the media production and consumption have long struggled to look inside the home to understand how mass media is used, received, understood and acted upon. In this case the artefact - the radio or television usually, takes second place to the 'message' broadcast into the home. Audience research and media research are of course commercial and academic research respectively, and appear to have little time for each other (Goodman, 1983; Hodge and Tripp, 1986; Morley, 1986; Lull, 1990; Morley, 1992; Silverstone, 1994; Östlund, 1998; Seiter, 1999).

5) *Historical studies of media and communications technologies*: The study of how the telephone, radio, television, etc were developed, adopted and used. Informed by a variety of perspectives. Again gender studies a strong source of material (Forty, 1986; Fischer, 1988; Schneider, 1991; Bouwman and Christoffersen, 1992; Bouwman, Christoffersen et al., 1992; Moyal, 1992; Thomas, Vedel et al., 1992; Flichy, 1995; Moores, 1995; Barbier and Lavenir, 1996; Carey, 1996; Moores, ; De Sola Pool, 1997).

6) *Consumer studies and marketing*, essentially commercial disciplines, often based around socio-psychological theories have looked for ways in which consumers can be categorised to best develop and market products and services. Consumer research has also evolved in the last 10 years so it no longer purely services the demands of marketing. (Lazarsfeld and Field, 1946; Midgley and Dowling, 1978; Hirschman, 1980; Chisnall, 1985; Arnould, 1989; Ward and Reingen, 1990; Hill, 1991; Thompson, Pollio et al., 1994; Belk, 1995; Brown, 1995; Dunphy and Herbig, 1995; Holt, 1995; Bates and Kennedy, 1996; Fairchild, 1996; Brown and Turley, 1997; Statt, 1997; Venkatesh, 1998) (Hirschman, 1980; Chisnall, 1985; Gatignon and Robertson, 1985; Alba, 1987; Burt, 1987; Hirschman, 1989; Midgley, Dowling et al., 1989; Ward and Reingen, 1990; Thompson, Pollio et al., 1994; Dunphy and Herbig, 1995; Mick and Fournier, 1995; Schouten and McAlexander, 1995; Stern, 1998).

7) *Diffusion of Innovations research.* This developed from rural sociology, studying the uptake of agricultural innovations, and expanded into consumer research and economics. It looks at the processes of adoption within a social system and how an innovation, be it a product or diffuses in that system over time. In this field there has been work on the importance of the social network in shaping attitudes, adoption and use. Included in this have been studies of computer and media technologies and associated services, e.g. (Coleman, Katz et al., 1957; Katz, 1973; Katz, 1988; Dunphy and Herbig, 1995; Rogers, 1995; Valente, 1995; Abrahamson and Rosenkopf, 1997).

[17] Consumer research is a field of at least five decades standing, that covers a whole range if issues to do with understanding people as consumers of products. The most dominant stream has been the study of consumers in order to inform commercial ends, principally marketing. The main social science resource has been social psychology in its various forms. However in the last 15-20 years there is much more emphasis on developing

consumer research as a discipline independent of marketing. This stream tapped into other social science approaches for inspiration, no longer focusing only on what influences people to buy particular products, but looking at many other dimensions of the consumer experience and our relationship with goods and other products away from the moment of purchase (e.g. (Hirschman, 1980; Hirschman, 1989; Holt, 1995; Mick and Fournier, 1995; Mick and Fournier, 1998; Thompson, 1998)). This latest convergence includes research on consumption and consumerism with a more cultural and critical approach (Belk, 1995; Belk, Dholakia et al., 1996).

[18] This is a research area that developed separately from consumer research, but with which it has many links.

[19] Rogers is a leading researcher in this field, who highlighted the diffusion process as he brought together a huge range of research material over the years.

[20] They have pulled together a range of research on adoption and diffusion to develop a general picture and model of diffusion of innovations for consumer research

[21] Rogers' stages of adoption:

Knowledge: This is the process of becoming aware of an innovation? Is it though a search for a solution to a problem or becoming aware of an innovation without a search: What comes first Need or Awareness? Some claim that is only through chance or accident that someone can become aware of an innovation (Coleman, 1966) . Other think that awareness must be initiated, and it is not passive. i.e. people expose themselves to ideas in accordance with their interests, needs, and avoid others. (Hassinger, 1959). Rogers also suggests that there are also three types of knowledge to consider – Awareness of existence, How-to-use knowledge and knowledge of the principles of the innovation. These are rather different and indicate different levels of engagement with the innovation.

Persuasion Following knowledge of an innovation, there is general attitude formation with regard to the innovation, but not a attitude formed. Rogers claims that this is not so much a cognitive stage as an affective or feeling stage. This also includes searching for information, and receipt of particular messages, and particular interpretations. Selective interpretation is important. Vicarious trials can be made of the innovation in thought experiments, something that experience and need skills make easier (see discussion on innovativeness later). . In order to reduce uncertainty the social group or network is used to seek information and to seek reinforcement of attitude by asking near peers for their subjective opinion. Again this is more reliable with an experienced network. The mass media too vague for this sort of confirmation. This is *innovation-evaluation information.*

Decision Stage While the previous stages can have lead to a rejection or avoidance without too much thought, this stage includes activities that lead to an active choice for adoption or rejection. Coping with uncertainty: Reduced by try out or trial on a partial basis. Adoptions that can be tried have much higher rate of adoption Trial by a peer is often a good substitute trial –by-others a vicarious trial. Change agents often sponsor demonstrations in a social system, especially by an opinion leader. There is often not a linear process of adoption according to Knowledge –persuasion- decision. For example: knowledge-decision-persuasion may be common when the decision is made in a group, and an individual is not convinced, but has to adopt. It depends on the local culture.

Implementation stage Putting the innovation into practice – involves a change in behaviour. Certain degree of uncertainty always exists at the beginning on implementation. Much active information seeking takes place at the implementation stage: how do I use it, how does it work, what problems will I encounter. Rogers suggest the implementation period lasts until the innovation is institutionalised, and "as an innovation loses its distinctive quality as the separate identity of the new idea disappears" p.173 Rogers also points out the importance of *reinvention,* the thread that technology studies had emphasised. From Rogers perspective many designers do not like the idea of reinvention and try to restrict it, but many adopters think it is great, and over emphasise the amount of re-invention

they have done p. 177. Reinvention, when it can be done, enables the innovation can be used to make it fit better the local situation, make it more appropriate> less likely to be discontinued. He reviews a number of research sources to explain reinvention:

- Relatively complex innovations are more likely to be re-invented which may be a simplification. (Larsen and Agarwala-Rogers, 1977).
- Reinvention occurs because of adopters lack of full knowledge about innovation, especially true where there is little direct contact between adopter and change agents or other adopters.
- It occurs for loosely bundled innovations, or abstract tools which are more easy to re-invent. This can be determined by designer (Von Hippel and Finkelstein, 1979).
- An innovation that can be used to solve many problems is likely to be re-invented more as each individual or organisation applies it to their own problems.
- Local pride – minor re-invention to make it appear a local product. Strong psychological need to reinvent – want to make it look different to others [personalise]
- Encouraged by change agents.

He concurs with the view of technology studies' researchers that the user is "active in the adoption and diffusion process"…"struggling to give their own unique meaning to the innovation as it is applied in their local context" p. 179. The failure of consumer research to take this into account can only be as a result of their research design not letting them listen to the respondents p.180.

Confirmation Stage : Often there is a search for reinforcement of the innovation-decision already made. A product can seldom live up to all the expectations held before adoption, so there will be some degree of 'dissonance' which the individual will try to reduce with certain coping strategies. One response is .*discontinuance*, or rejection after adoption, which can be very high for some innovations. Rogers suggests replacement and disenchantment as two reactions to discontinuance. Discontinuance is also very common when the costs of use are very high, such that discontinuers are often similar to late adopters or 'laggards'.

[22] The theory suggests that the adoption process follows a progression that normally starts with finding out about something (knowledge), then going more in depth about how it could be used, assessing it, find more information, (persuasion), then a decision is made to adopt or not. If the innovation is adopted it is followed by a bedding-in period, where more information is found, and it becomes part of routines and infrastructure (Implementation). This can be followed by or include a period of 'Confirmation' where expectations and new information are confirmed or challenged about the innovation and the decision. However adoption may not always follow this progression, and it maybe doubtful that some of the stages exist. Indeed, it would be difficult to separate them and Rogers questions whether there really are stages, but in studies people report stages of decision making that convince him. However there is very little research that actually follows that adoption process over time that can really tell this. Many researchers suggest that 'high cognitive involvement' products, that involve the consumer making quite important decisions this model is followed in a fairly linear manner, whereas low involvement products this process is much simpler and less rigid. However Rogers is not dogmatic about these stages, nor does he suggest that they will all necessarily occur, or occur in this order.

[23] At this point it is worth going mentioning the notion of 'cosmopolitanism' introduced by Rogers in his theory of diffusion of innovations (Rogers, 1995), as a factor explaining why some people are earlier adopters than others. He refers to individuals who network outside their social system, travel more, and are aware of events outside their close social network. In particular, they also greater users of general and specialised media sources.

[24] Sociometry: the statistical study of behaviour and relationships within social groups, especially expressed in terms of preferences.

[25] Silverstone uses the concept of 'ontological security'[25] as he argues for television as a support and reference point for our self-identity and our relationship with the rest of the world (Silverstone, 1994). The psychologists (Csikszentmihayli and Rochberg-Halton, 1981) suggest domestic objects are used in formation of our self-identity, particularly for emphasising integration or separation from the social context. Technologies lend themselves to this in different ways. McLuhan famously proposes technologies shape the way we see the world: therefore changing technologies and especially media technologies, will lead to a change the way we perceive and relate to the world and ourselves in it (McLuhan, 1964).

[26] He investigates this through, literally, a novel method, the novel, in this case John Updike's Run Rabbit Run. The technologies in the case of Rabbit (the main character, who sells cars and constantly reads magazines reviewing consumer goods) were the consumer artefacts of the 1950s, especially the car. The series continues through 5 decade, each with their new technologies, which Updike shows are intimately linked to the American way of life and consciousness. Hickman suggest fives roles for technologies: Personation - technologies allow us to play at being ourselves; Authentication - they help define who we are; Distraction - from obligations, unpleasantness; they are the Focus of Desire; and appear to be Magic – something we do not quite understand, but enchants us (Hickman, 1988).

[27] An example of expressive relationships with technology is the motorcar (Lamvik, 1996): we can have a very personal intimate, existential relationship with the car itself. The car is also a essential part of community building today, with the car as the" cathedral of our time" (Barthes, 1957). It is not only the car as an object that is important – it is the car in use, the experience of the machine. Through these different levels the car is a highway to other worlds of meaning and imagination.

[28] It should be pointed out that he uses a rather linear model of development of meaning – "products are vehicles of cultural meanings", marketed and shaped with an aim to integrate and reflect cultural values by advertisers, with consumers then adopting those meanings though rituals and actions.

[29] The rituals that McCracken (McCracken, 1988) describes are, in more detail:

Exchange Rituals - The choice and presentation of a product by one person to another. Gift giving is common in our society, particular at Christmas and birthdays. The gift is accompanied by the movement of meaningful properties too, as the gift giver often wishes the recipient to take on meanings associated with the artefact. "The ritual of gift exchange established a potent means of interpersonal influence. It allows individuals to insinuate certain symbolic properties into the lives of a gift recipient" (McCracken, 1988) p. 84 In this was the gift-giver give can become an agent of meaning transfer and change, selecting goods for people who may not otherwise have chosen them.

Possession Rituals – These are the activities of discussing, showing of, reflecting on, comparing etc that we do with products in the home, activities of 'personalisation'. This is a key part of the appropriation process, and making the product 'our own'. This involves both taking on board the meanings associated with the product from the broader culture, and finding our own personal interpretation, as well as usage.

Grooming rituals – these appear to be an extension of possession rituals, especially for more perishable products, which includes many things from a hair style to a car. This includes ICTs to, such as the PC, which need constant grooming to keep them going. People will invest a great deal of time in these rituals for important products

Divestment rituals – These occur either on the obtaining of a second hand goods, where the owner can claim the good from the previous owner by erasing meanings associated with them, or in the process of dispensing with a good, and coming to terms with no longer owning it. This can also apply to dealing with the loss of a good.

[30] Hannah Arendt (Arendt, 1958) suggested that quotidian artefacts serve to stabilise human life: they provide practical and symbolic supports and continuity to our lives. Others have the same approach. Silverstone (Silverstone, 1994) uses the concept of 'ontological security'[30]

as he argues for television as a support and reference point for our self identity and our relationship with the rest of the world. The psychologists (Csikszentmihayli and Rochberg-Halton, 1981) suggest domestic objects are used in formation of our self identity, particularly for emphasising integration or separation from the social context. Taking this further, Hickman (Hickman, 1988) investigates what he calls the "Phenomenology of quotidian artefact", to show how people use technologies for self stabilisation[30]. He suggest fives roles for technologies: Personation - technologies allow us to play at being ourselves; Authentication - they help define who we are ; Distraction - from obligations, unpleasantness; they are the Focus of Desire; and appear to be Magic – something we do not quite understand, but enchants us. An example of expressive relationships with technology is the motorcar (Lamvik, 1996): we can have a very personal intimate, existential relationship with the car itself.

[31] For example, (Leung, 1998) shows that in urban China the "adoption of certain new media products appeared to project certain social identities such as 'life expansionists', 'sophisticated and fashionable' and 'pleasurable and enjoyable'" (see later section on lifestyle)."Consumers manipulated consumption object meanings to fit their social identity"

[32] A12 country study "Los niños y los cambios en su entorno mediático" (Children and the changes in their media environment) (Garitaonandia *et al,* 2001) suggests that children always prefer to play with other children, and use the video console to relieve loneliness, and immediately stop if offered other things to do by their parents. However social use of video games is very important (Holt's "play") . (Galarraga, July 2001) in El Pais.

[33] We need some simple way to understand the way that we use and experience media products that we can apply to understand the adoption and diffusion of new media products. By media product, I mean not the media content or the channel, but both together, and their use in context. This demands a phenomenological approach, that is essentially based on the understanding the lived experience of individual and groups.

There are 2 main factors that attract us to media products and keep us using them which relate to the expressive and instrumental uses notes above. These are *Engagement* and *Utility*.

Utility is what we find useful in a product, in use, it is the benefit we judge to get from using it - to relax, to inform ourselves, to search for information, to learn, to spend time with colleagues and friend, or to be seen by other people. We can make calculations about the effort taken to use a product and the benefit we gain, and designers and service providers create, maintain and promote products that satisfy these calculations. The provision of relevant information, user friendly interfaces, quality production values, and acceptable prices is the stuff of a utility-satisfying industry.

However, this is not enough to attract us to a product, and make us come back to it. A media product has to be *engaging*. If our interest and imagination are not captured, then however useful a product may be, we will be reluctant invest more effort in it than is necessary, and we may be easily seduced by an alternative. Engagement is what keeps us glued to the TV, to a book or video game way past the time we should have gone to bed, or leads us to spend a fortune on recordings of our favourite artists. Engagement leads us to surf the Net for hours. Artistic talent, promotion, visions, novelty, celebrity and wonder are the stuff of engagement-satisfying industry.

Both TV and Internet media products play on utility and engagement. However TV with decades of experience and based on centuries old artistic and communication forms has the upper hand on engagement. The Web, through its novelty leads many people though an engagement stage, but the majority Internet media products are based on satisfying utilitarian motives. Only video games are a truly engaging new media form, as the content and channel are integrated in an almost entirely novel way.

We can see that the engagement or utility of a particular media product depends entirely on the user or viewer. One person's favourite programme is another's load of rubbish. The BBC may be all I may wish for in a TV station, you may hanker after 200 channel of global

television of every sort. Personal taste, resources, peer pressure, occupation, commitments and social network will all effect our exposure to and subsequent use of media products. It is this minefield of individual circumstances that the developers of new media products are stumbling through.

The process of innovation is no straight forward one of development and selection in the market. The multimedia environment is one of visions, wonder, hype, celebrity and creation - tools of the engagement-satisfying industry. But the products that are produced and to a certain extent sell and are used, are those that satisfy utility. While there are starting to be more and more useful products, there are few multimedia products that really engage in use. Nonetheless, Engagement is still an important factor in multimedia. There is a common fascination in the discovery of new worlds in cyberspace, and of exploring the wonders of technology, and there is an incredible stimulation the imagination for future uses. This may be enough to get us to buy PCs, set up businesses, or invest in infrastructure, but it is not yet getting substantial number of people away from their TV sets[33]. Aside from work and everyday tasks, the main thing that is driving the information revolution into our homes and everyday routines is the capacity to communicate in new ways, and engage with other people directly.

[34] In greater details, here are Rogers' factors:

Relative Advantage The degree to which an innovation perceived as being better than the idea that it supersedes according to economic profitability, prestige etc. There are a number of dimensions to relative advantage, and they change over time. A product may be judge on the status it brings, because it is early on the market and is expensive. However dropping costs over time as a product diffuses can completely change it relative advantage in terms of status, and functionality as it becomes a accessible to the mass market. Some products have their relative advantage increased because of incentives by change agents, but often this does not lead to long term adoption. In some case there is a mandate to adopt, such as a law, or a company policy.

Compatability The degree to which an innovation is perceived as being consistent with existing values, past experiences and needs of potential adopters. These include socio-cultural values, previously introduced ideas, and the needs of the adopters. Products are less likely to be successful if they carry meanings that conflict with basic values or established practices. Alternatively If an innovation appears too similar to existing products people may not se the point in adopt is. This can also occur if it is too similar to earlier failed innovations. Consumers are intelligent and experienced and can place innovations within a cluster of other technologies, making relationships between technologies that experts from outside a local culture may fail to appreciate. An innovation also has to be seen to meet a need. However this need may have to be constructed by a change agent in order to make the product salient.

Complexity Degree to which something is perceived as being complex – difficult to understand and use. Negatively associated with adoption. Rogers give the example of home computers. Earlier hobbyists did not see computers as complex (maybe they liked it that way). Later adopters of IBM PC etc were baffled by complexity and did not have technical expertise. (Rogers, Daley and Wu 1980) found 6-9 weeks of extreme frustration before people joined a computer club, when they were obtained help from friends or other means of help. He suggests that the complexity of the PC was the reason for its non adoption in the early 1980s.

Trialability Things that can be tried out are more generally adopted. The trial allows the potential user to create their own meaning from first hand experience, dispelling uncertainty. Assuming a positive trial this is positively related to adoption. Earlier adopters find trialability more important than later adopters as later adopters have lots of people around them who have already adopted. In this case their peers act as vicarious testers. This means that the later adopters often move to full adoption faster than innovators and early adopters.

Observability Degree to which the results of innovation are visible to others – positively related to adoption. He suggests that software is less observable than hardware, so diffuses more slowly, which may be questionable in 2001. Technologies that are highly visible in everyday life are more likely to be adopted, since it is hard not to notice them and to learn something about what they are and how they are used. Of course at certain stages in the diffusion of a product that can have a negative influence if the technology or the users as seen as a social nuisance, or represent a group that someone is in opposition to (Rogers, 1995).

[35] Fournier develops a meaning-based framework for the relation of consumers and objects. She suggests eight categories of meaning that exhibit "a characteristic pattern of tangibility, commonality and emotionality". "*Objects of Utility*: significance tied to characteristic attributes and benefits and the inherent need satisfaction these provide *Objects of Action*: benefits from the experiences and emotions they allow. *Objects of Appreciation*. These objects are experienced and appreciated as a whole. *Objects of Transition.* These items provide their users with feelings of serenity, security, warmth and comfort in times of change. *Objects of Childhood*. A special category is included for objects that were once used during childhood and are picked up again in later years. *Ritual Enhancers.* These objects are associated with habituated behaviours and personal rituals, serving as mediators of valued personal experiences. *Objects of Personal Identity*. Objects of personal identity make statements about the actual or ideal self and telegraph the values that are centrally held by the individual. *Objects of Position and Role*. These objects make statements regarding self at the cultural level, serving the function of integration into society." (Fournier, 1991)

[36] The cognitive processing model suggests that different products need different amounts of work by the consumer (Gatignon and Robertson, 1985).

[37] The introduction of technologies into the home has also been associated with the parallel introduction of external ideas about what people should do in the home, particularly women (Cowen, 1985) The development of new technologies for the home is often done with particular ideas about what the home space is actually for [Stewart, submitted 2001 #493].

[38] The term household and family vary in meaning over time: household often refers to many people living in and around property, including the family. Family of course includes varying degrees of extension to the nuclear family depending on local culture.

[39] The family is not a stable unit – there are important life-cycle factors that influence the decision making process, and the types of products purchased (Wilkes, 1995). There has traditionally been a liner model applied to the family life cycle – bachelor, newly married, three stages of 'nesting' then to an empty nest followed by solitary survivor. However many changes in society are staring to make this model outdate – many people have family later, and start with much more money, families break up and are reformed, people divorce with grown children relatively young, and retired people are more active

[40] Silverstone discusses the household and the moral economy in more depth in his study of television and everyday life (Silverstone, 1994). He uses the term moral economy based on David Cheal's discussion of the gift economy, where there are social as well as economic transactions (Cheal, 1988).

[41] For example, there can be a number of roles within the family that can be taken on by any individual. These include the initiator, introducing an idea; the influencer, proving information and attempting to persuade the family to adopt; the decider, who makes the decision; the buyer, who actually makes the purchase, and the user of the product. Often attached to the buyer or initiator is a gatekeeper, who makes decision on allowing critical information or products into the home (Statt, 1997). For different products, different people in the family take on different roles – normally either the husband or the wife - a topic that has been the subject of considerable research, especially in light of the evolution of the roles of men and women, and the changing family. This also includes the growing influence and recognition of the role of children as informed consumers in the family unit, an important factor when it comes to ICTs. The study of the use and meaning of domestic technologies highlights the conflict that can occur within a family, and the strategies used to manage this when it occurs

over the adoption of new products: for example, (Statt, 1997) suggests four main strategies: coercion, manipulation, bargaining and persuasion, strategies that are also noted in other work on domestic consumption (Moores, 1996) and communication (Anderson, Tunalay et al., 2000).

[42] Children are more likely to have their own rooms now (72%), and use them as a place to consume their own media, and share this with friends. Family income is not a predictor of media technology in the bedroom, but parents education or culture is, with middle class parents being more disapproving and less likely to provide screen technology, instead giving books (Livingstone and Bovill, 1999).

[43] (Livingstone and Bovill, 1999) provisionally identify six styles of family interaction:

- The *intimat*e family which talks often about things and eats together.
- The *distant* family, where there is little sharing and children do play games and watch TV with friends rather than parents.
- *All Round* Families, where interaction with parents is high, and children play computer games with family members
- *Conventional families* which eat and watch TV together, but do not involve children in decisions and where children play computer games alone
- *Outward looking* families, which are most likely to talk about things together – the news, the media and things important to the children
- *Democratic families* where big decisions are shared but this is not connected to media use.

Families often move though a range of types of interaction as children grow older.

[44] Silverstone develops the concept of the moral economy and domestication partly to deal with the interaction between the public market and the private, domestic economy (Silverstone, 1994, p.45)

[45] One of the main group of studies looking at domestic ICT appropriation and use that influenced this research came out of the UK Programme on Information and Communication technologies (PICT) in the UK in the 1980s and 1990s include studies of the consumption of a range of media technologies though in-depth ethnographic-style research (Silverstone, Hirsch et al., 1990). It compares the interpretation and use of the television, the telephone and computer in different types of household, from a wealthy family to single mothers. Much of the inspiration was from ethnographic studies of media use such as those done by Morley (Morley, 1986; Morley, 1992) and Lull (Lull, 1990), and from cultural studies of consumption (Bourdieu, 1984; McCracken, 1988). It was also influenced by technology studies which link the material and physical to social relationships (Latour, 1987; Akrich, 1992; Bijker and Law, 1992). This research has been extended by several of the main researchers, such as Roger Silverstone, Leslie Haddon, Sonia Livingstone and others though various research programmes including the EC support network EMTEL.

[46] Appropriation: when the object is sold and brought into the home, it becomes a domestic object. It leaves the world of the commodity, and becomes owned, and 'authenticated'(Miller, 1995). The act of appropriation, whether it be buy, accepting a gift, finding, can be significant in itself, central to a household or family creating and defining themselves (fashion for example), so there is symbolic work done in ownership and possession. The term Appropriation is sometimes used to describe the whole process of domestication, and is preferred by some researchers.

Objectification: "Is the practices of display in the home, the creation of the environment - an objectification of the values and the aesthetic, the cognitive universe of those who will live with it" (Moores, 1995). It is expressed in usage and physical location, and particularly reflects factors such as status, and will express spatial differentiation- private shared, contested, adult child, female etc. Artefacts are placed in existing locations, with existing aesthetics. This can also occur with media and non-material objects. Media technology is also objectified in the talk about the technology and for example, television programme.

Incorporation: "When it is made active use of in the performance of the task" (Moores, 1995). . It is how a technology or service is used in everyday life, and how the household expresses its cultural preferences (Berg, 1996). This is dependent on the function of the artefact, whether intended or not. Sometimes a technology may save time (a washing machine), or it may shape time use, the television. Again Incorporation will modify and often reinforce gender and age differentiation (teenagers and stereos), and become part of conflicts of control and ownership.

Conversion: defines the relationship between household and outside. It is "a 'trading in' of competencies, meanings and pleasure cultivated in the private domain. (Moores, 1995), for example television programmes - the 'outside' and public play a very important part in everyday household discourse. In the other direction, ownership sometimes has to be displayed externally - such as the satellite dish - and the attitudes the household members develop and take out to the 'public' world. Media technologies, such as the telephone are doubly articulated here - they are the medium for communication and also the focus of communication.

This may be a rather too elaborate theory, with the distinctions between different parts of the process being unclear, even in the authors' own work. However it does give us some useful points to hang empirical work on, and emphasises the many symbolic and practical processes occurring around media technologies.

[47] Some people will put more into this than others – for example the secretary who decorates her computer and feels a very close relationship with it (Mick and Fournier, 1995), compared to the engineer who just sees the machine as another tool to do the job.

[48] The other essential issue that McCracken starts to investigate is the way that products and activity meanings are linked in constellations of complementary meanings. The *encyclopediste* Diderot wrote an essay about the unhappiness he felt on replacing an old dressing gown with a brand new one. The new one looked so out of place, made everything else in his room look old and worn. He then felt he had to replace everything else, which he did, slowly, until everything had been renewed. McCracken uses this as the basis for proposing that products can be linked symbolically, some products will 'fit' into the constellation or 'Diderot unity;, and others will not. This leads to two contrasting effects. First it is a recipe for traditionalism – people only consume within their symbolic constellation, and will resist change. Second, it leads to continual change of the whole constellation. The Diderot Effect. Consumers are naturally curious and experimental, technologies can also sneak new products in with a 'Trojan horse' effect on the back of other products, and we also obtain new products through gifts. Thus most consumers will have new products coming into the constellations all the time. When this happens it has to be re-evaluated, and often leads to the whole constellation being changed.

The importance of this argument is that ICTs can be seen as being linked symbolically as well as on basic technology despite having very different uses, features, functionality etc. Thus consumers will resist all ICTs what ever they are. However when one is introduced, by obligation, as a gift, or by Trojan Horse, and it is accepted, then the constellation is upset. Everything is now reassessed in terms of ICT acceptance, leading to adoption of a range of other products that were resisted not because of their usefulness or practicality, but because of their meaning.

[49] The research on radio, such as that done by Shaun Moores (Moores, 1995), and others is interesting: Early radios were kits, hobbyist toys. They were mostly used by men and boys, although because of the cost more men had access. They had no speaker, but used headphones. It was a toy (like the home PC in the 70s and 80s), and the users were fascinated by the technology. The broadcasts were not important, it was being able to make the thing work. However for the owner's wife the radio was often far from wonderful. It was a mess of wires, ugly, the batteries leaked on the furniture (their job to clean up) and they had to keep quiet: there are accounts of women having to keep silent all evening because their husband was listening to the radio. The radio was completely useless at this stage: if you

were trying to have a conversation, maintain your family life, or do the washing, the radio was no pleasure, rather it was a threat. This is a story that occurs over and over again with new technologies entering the home.

An interesting aside on early radio is that it was not a receiving device only, many people wanted to broadcast - not only to play, tinker with the technology, but to talk to other people about it on air. The story of the development and restriction of private broadcasting can be usefully compared to Internet developments today which follow the same course, but have fewer physical barriers to proliferation of broadcasting.

Continuing the biography of the radio technology and service, Moores' example shows how changing technology take a different place in the home, and acquire new meanings as it develops. The new models did not need their owners to be tinkerers - they were stand alone, running on mains or batteries (the radio was important factor in making families adopt mains electricity). They became a piece of furniture, or symbols of modern life. These new sets had started to find a place in the home - to be *objectified*. The furniture had to be rearranged, it had to fit in with the household aesthetic. Women now started to have a say in buying the radio. And help decide whether to have radical modern new Bakelite set (the iMac of the 1920s). or an antique cabinet effect set

Instead of dividing the family, the radio now brought them together, to share listening. And crucially, for some commentators (Rowntree; Jennings and Gill in Moores 1995) it 'significantly increased the attractiveness of the home a dwelling place and a site of leisure'. It made people 'retreat' into the private sphere, which from a middle class point of view was a step in the right direction for the working classes. It acted as a factor in conversion of the relationship between the public and the private (a controlling father example). The Radio helped to define household routines and practices, and broadcasters - the content - reflected and encourage this - broadcasting to the family. We have a changing meaning in the technologies biography - it is now a part of the family, the modern hearth. It was also aimed much more at women, as monitor of the private sphere, and programmes were aimed at 'training' mothers and wives as experts home affairs, empowering them, but of course in a very limited way (Donzelot). It became a woman's companion, but not necessarily on her terms.

The process of *incorporation* of the Radio was strongly based around time - the shaping and adapting to everyday temporal activities. People would adjust their schedules to listen to regular programmes, and programming was designed to fit around supposed family routines - when meal times should be, when children should go to bed etc (this is still the case today). Another effect of this was to create 'national' routines, not only everyday, listening to the 6 o'clock news, but following national events, creating the 'national family'. Moores has a nice example of subversive use of this though: in the UK the 'Boat Race', an elite rowing event, was accepted as a national event because of the opportunities for betting.

The telephone is an other good example of the early development of a mass market technology where the market drove innovation in the system and usage once the basic technology had been developed. The telephone was first regarded as a business tool. The most valuable customers were business users, and phone companies did not like people using the lines just for chatting. Phones were installed in middle class households for home shopping, ordering goods from the local store. It was unheard of for two respectable people to phone each other. However in some communities, especially in rural areas the phone changed use. Farmers originally installed the phone to do business, but their wives also found them useful to gossip, to become more in touch with the community, enliven their isolated lives, provide care giving and run community life. In many different areas these personal uses of the phone grew, and phone companies were obliged to accept them. By then the technology had advanced, and they were able to provide many more lines and were happy to encourage any use (this has a strong parallel with Internet and Minitel use)(Fischer, 1988; Moyal, 1992; Frissen, 1994; De Sola Pool, 1997). One pattern persists today, men use the phone less than women to chat, and phone companies have to try to encourage men to

use the phone socially. The differences in usage can cause problems when phone companies change their charging structure. Users are affected in different ways, by say the cost of long distance calls being increased, while local calls are made cheaper. Those who live a long way from their friends and family will be penalised over those living close. (Lohan 1999). The telephone has undergone a big transformation in recent years with the arrival of the mobile phone. Here again one sees different user groups developing particular uses, and differences in uses across gender, occupation and age. One example is the differences in men and women's use of the mobile where some women use mobile phone to keep in touch with family where ever they are (" remote mothering"), men will use it to bring work home (Rakow and Navarro 1993) quoted in (Frissen, 1994) (Some telephone companies (e.g. BT) are now trying to get men to phone home more with recent adverts that show the father away on business calling his children.

[50] One could argue that just as many people listen to the radio as use the telephone at work, and that broadcast radio, although the dominant use, has now been overtaken by two way radio in the form of mobile telephone.

[51] In broader studies of home technologies there are products that are necessary and those which are luxury (Gray, 1992). The washing machine is a necessary technology, all recognise that, the TV possibly too – it too is used all household members albeit vicariously in many cases. However there is dispute over other machines – how quickly would they have to be replaced if they went wrong? With many new products, such as computer or Internet connection, or the mobile phone, coming into the home, can we see how they are being interpreted? Mobile phones and internet connections are certainly seen by many as necessary now, but I suggest in a rather different way to a washing machine. How about at the workplace – what happens when a computer system fails? At home, one would imagine that the computer is more of a luxury, and even when it is used for work, there is always the workplace to go to. Only when it is the only machine is there a problem. However, the crisis of losing the contents of a hard disk can be terrible when it happens anywhere. At a workplace the loss of a computer system can be disastrous – and could almost completely stop work.

[52] Technologies are **Necessary** - they become essential parts of everyday life e.g. (washing machine) female. The necessity is interpreted differently by different family members which reveals their concerns and priorities etc

They allow **Control** over things, time, and other people. For example, the housewife's control over domestic lives and children. There is also the example of relinquishing control to get out of responsibility for doing it. Men also express a strong controlling wish to 'controlling nature' or their family

They are **Functional**. This can be interpreted in two ways. For some, generally male there is an interest in the intrinsic functions of technologies. For others, a more female attitude, it the utility for the technology as a tool, rather than its complete and often unusable functionality

Technologies allow **Sociality and Privacy** - ICTs facilitate social contact with outside world. We talk to each other on the telephone, and watch the world on TV. Social contact appears to be more important for women, especially the telephone. In reverse it allows people to keep the privacy of their own home, or their own room such as teenagers reinforcing home boundaries by playing their own music in their own room music etc. More recent research by Gournay and Mercier (Gournay and Mercier, 1998) on this issue is discussed later.

[53] Of course this is a variation on the old washing up trick – break enough plates and you will never be asked to do it again.

[54] In one example an older man was not at all pleased to have this newfangled gadget in the house, but he accepted it because his wife had to receive phone calls from her family in Korea. However once they got the machine installed he realised he could use it to filter all the calls coming to the house, especially from the boyfriends of his daughters, whom he disapproved of. He could then reinterpret the technology as a device for control, an important personal value.

[55] Sørensen would debate this giving that role to the car (Sørensen and Søgaard, 1993). I would now see the networked computer taking over this role.

[56] The technology most heavily studied before computers was the television. The television and television technology have an important place in the home, not only in terms of control over the device, but as also Silverstone emphasised, the focus for the on-going development and sustenance of family relationships through viewing. (Lull, 1990) found that the TV played an important role in the everyday activities of the household, and use reflected the dynamic of the social relations. TV programmes are used as topics of conversations that can be shared by all the family, they provoke discussions where expertise and can claimed and refuted. He also studied the famous 'remote control effect' where men tend to demand control over the remote and have the first say on what is shown.

[57] (Livingstone and Bovill, 1999) in there study of the media use of children in their bedrooms found that working class children and children of less education parents were far more likely to have their own screen based entertainment media (TV, Video, games machines), but fewer books.

[58] This prejudice is expanded by the impression held by many (much to the dismay of the cable companies) that multichannel TV in the UK is 'just American rubbish', and associated with 'lower class' or popular products such as football and Hollywood films, and even more dubious material. On the other hand, many people have adopted multichannel TV to get some of the programmes they would never otherwise, from 24-hour cartoons to specialist sports channels and documentary channels, or to have an alternative to establishment media style and content, and limits on the numbers of channels that are a technical and institutional relic.

[59] (Livingstone and Bovill, 1999) finds that parents are slightly worried about television affecting their children, but positive about the role of computers (although less so for girls and working class parents).

[60] One theory for the decline of interest of girls in computing as a career in the UK since the 1980s is that the early home computers were only suited to playing games that appealed more to boys, creating a culture of exclusion that has never gone away.

[61] A group of researchers in the USA with a background in consumer research have developed a large research programme on the adoption and consumption of ICTs in the home. These authors include Ruby Roy Dholakia, Nikhilesh Dholakia and Norbert Mundorf based in Rhode Island, Jennings Bryant, Alladi Venkatesh and John Carey, who has done many years of research on interactive television. One publication, New Infotainment technologies in the home, demand side perspectives (Dholakia, Mundorf et al., 1996a) brings together some of their recent research.

[62] Nippert-Eng studied employees of a scientific laboratory, doing a study that bridged the home and work (Nippert-Eng, 1995). Specifically she compared scientists, who generally made very few boundaries between home and work, and machinists who had very strong boundaries. For example, the scientists would take work home, make personal calls in the office, discuss home problems with their colleagues and management, their friends would also be their colleagues, and frequently their spouse would work in the same laboratory. They would keep personal objects in the work place, and have work computers at home. Not all did this, some preferred to segment their life, especially if their family demanded it. They were allowed this discretion as the management assumed that their personal priorities match their workplace priorities. The machinists on the other hand were given little discretion in making boundaries, and they themselves enforced boundaries strictly. This included strict time keeping, both of work time, and of personal break time, with no question of taking work home, or doing home related activities in the workplace. The management had little trust in the employees, and they had little trust in the management. This was not entirely work based boundary – their families would also demand to keep work out of the home. In between these groups were foremen and office workers who had more discretion in their boundary

making. There are different sorts of workplace: *bureaucratic,* where there are strong rules about boundaries, *greedy* which tries to take over the home sphere and *discretionary.* These do not describe what the boundaries are, but the amount of discretion given. Nippert Eng points out differences between occupational status, where lower status are *expected* to be more segmentalist, and those of higher status more integrative. There are also difference between the US and Europe, with the workplace having a much higher demand on personal time, using integration to eat into the home sphere. Europe is also integrative, but in a more balanced way. (ibid.)

[63] The research reveals important differences in the way people use the telephone. One variation is over the *life course*. Younger people talk on the phone a great deal – making friends and being part of the group is important. They use the phone everywhere, in the bath, on the street. However once people start to work, spending much more time on the phone for instrumental uses, they want to keep off the phone at home. People increasingly use the answering machine to filter calls, to avoid having to be on the phone, on demand. They loss the familiarity and art of the phone conversation. Domestic conversations become more businesslike, brisk and to the point. As people get older this changes again, they rediscover their community, and the phone no longer has such work oriented connotations. Different occupations lead to different phone use. Self employed people, musicians, and freelance workers will use the phone flexibly and mix home and work calls. Many of the people they speak to are friends as well as professional colleagues or potential customers. Company managers (*cadres*) are very different: they are under the scrutiny of their organisation, and when they leave work they want to get away from the phone. They do not want to be at the 24 hour beck and call of work. Any study of the use of ICTs in everyday life needs to look at a range of different types of occupation, and be aware that many have always integrated the spheres of life in different ways. This research identifies “five types of professional life that influence the tolerance towards intrusion of professional life on private life”.

artisans and small business proprietors: crossover inevitable, often un-contactable during work hours *{pre mobile phone}* professional phoning in morning or early evening. Sociability is often limited, and professional circle often linked to family. Close links between private and professional spheres

Intellectual and artistic professions : researchers, teachers, musicians etc. the division of private and public is not a constraint (c.f. 1) but part of belonging to a milieu. People linked by common interests and a certain institutional independence. Common to use the phone outside normal hours. This group involved in community activities the most.

Freelance professional. ‘use socialising’ personal social network could be used for work. Use of the answering machine accepted as normal. ‘Modern’ integrated the technology in their lives and have got over cultural inhibitions. More direct on phone. Mix personal and professional relations.

Liberal professions doctors lawyers etc. clients could become friends. Relations of equality with clients. Loyal clients. Who often know home number. Good manners important, people will not disturb them at home except in case of emergency, and then accepted as normal by family.

Modern salaried people, executives, managers etc: defensive attitude. They are in a hierarchy, at the command of superiors and clients. Obliged to be at work. Desire to keep some barriers, don’t risk friendships at work or with clients.(Gournay and Mercier, 1998).

The research also found that the greedy workplace is allowing the family and personal communications to come into this sphere, with many people using their work time to make the phone calls they need to. The work phone number is becoming the ‘personal’ number as this is the most reliable place to find someone (although of course with the recent rise of the mobile phone this is changing). As a result some people are reducing the use of the phone at home, preferring face to face relationships, leaving phone use to adolescents. Others are preferring to bring work home and use the phone to discuss it from home, away from the

bustle of the office. Both these trends are away from the use of the home phone for personal communications. Overall they found a reduction in vocal communication and a rise in phone harassment, with people reducing the number of contacts they make, preferring to use asynchronous Internet communication which is easier to control. The voice communication of the past is being replace by written communication, with a reduction in spontaneous communication. A new balance between forms of communication is emerging, in favour of lower interactivity, and considered reply.

[64] A quantitative branch of social network theory has attempted to develop ways of demonstrating 'macro' level effects through mathematical aggregation of micro-level relationships (Wasserman and Faust, 1994, Scott, 1991 #364).

[65] The study of social networks and their role in the diffusion of innovations was a very early part of research into the diffusion of innovations.

[66] Litwin (Litwin, 1996) in studies of older people's networks suggested different sorts of network : kin focused, family intensive, friend focused and diffuse tie in network in a study of elderly Israelis . While those studying the adoption of innovations focused on the social network as a mechanism for the transfer of knowledge and ideas and for forming of opinions, other work on social networks looked into areas traditionally seen as being relevant to community, an area discussed in the next section. In particular, the social network is seen as providing a whole range of social and economic support Litwin's networks of the elderly were suggested to provide this sort of support, although Litwin noted they are not always actually helpful. The support is emotional and instrumental, but Litwin suggests we need more work to find out how they are actually used for support. Other researchers have also looked at support networks in other situations, such as for the mentally ill (Gottlieb, 1981). Perhaps the main studies in this area are by Wellman (Wellman, 1982), In his research on personal communities he conducted longitudinal research in social networks in Toronto that showed that the social network provided support and resources. He also noted a number of features: our social network is not made up only of people we get on with, but also others we do not like. The support and exchange of resources is not symmetrical either.

[67] The community as a social support has been studied for networks of people who are brought together by circumstances, such as single mothers (Bates and Kennedy, 1996), and sufferers of particular illnesses.

[68] These include innovations within professional domains, such as adoption of new drugs in the medical profession (Coleman, Katz et al., 1957) and new techniques in agriculture (Rogers, 1995) new technology in small African and Asian villages (Hossain, 1998), and in the field of ICTs and consumer products. In particular, (Rogers, 1985) showed the importance of social networks in the diffusion of personal computers in Silicon Valley. The idea of the social network and diffusion has also been used extensively in public health fields such as epidemiology to examine the diffusion of disease and also to study the diffusion of attitudes to treatments and sexual behaviour (in the case of AIDS). There is an considerable amount of quantitative research now available studying the adoption and diffusion of innovations, both in the consumer market, and in industry (Shampine, 1998).

[69] When linked to network technologies that need a social network to adopt and use them, there are interesting interrelations. Rogers investigates the differences between the diffusion of networked and stand alone technologies, showing they are slower to take off, but then diffuse much more rapidly. The important of the adoption of technology following a natural social network is obvious – if none of your network have the device, there is no one to talk to. An example of this was found in a trial of the videophone in France. A first trial gave the video phones to people who lived in a certain area. Of course, most of them did not want to talk too each other. A second trial used a snow-balling system, asking people who they would use the phone with and distributing the devices in these networks. It was adopted! (Paper presented by France Telecom at 'Pensee Les Usages' July 1998, Archachon)

[70] In particular, this includes social class, family, religion, sex etc which have a strong influence in early life. However people change and other groups become visible, some of which will become reference groups or aspirational groups. Reference groups theory

proposes that groups provide a standard against which the individual evaluates themselves and others (Rice, 1993). The individual aspires to certain of the values, attitudes and behaviours of these groups, in attempt to change or to satisfy their own self identity. This can involve actually changing membership, for example though life-cycle events such as having a family, and by behaviours that will enable one to enter an aspirational group, such as pursuing a particular career. There are also behaviours that do not take one out of a membership group. This includes copying the behaviours of aspiration and reference groups. This type of behaviour is especially suggested in the following of fashion, and some would suggest that many consumer behaviours are based on the copying the behaviour of others in order to be more like them.

[71] Whyte's 1954 study of air conditioner adoption in Philadelphia suburb suggested on the basis of anecdote that the key factor in ownership was the 'vast and powerful network' of neighbours exchanging product information ((Whyte, 1954) quoted in (Johnson Brown and Reingen, 1987)). The following year Katz and Lazerfeld[71] did a formal study of influence and found word-of-mouth influence in the social network very important in the purchase of household goods and food (Katz and Lazarsfeld, 1955). They found that WOM was seven times more effective than personal selling, and twice as effective a radio adverts in encouraging people to swap brands They looked at the importance of different sorts of influence in consumption, for example, what influenced people to see a particular movie, comparing personal influence with magazines and newspapers. They also looked at the relative importance of personal influence and opinion leadership in different social groups and or different products. For example the opinion leader was very important in fashion for girls. (Lazarsfeld and Field, 1946).

[72] In sociology, one of the most celebrated papers in the area of social networks is Granovetter's 'The strength of weak ties' (Granovetter, 1973), since reprised and developed several times (Granovetter, 1982; Granovetter and Swedberg, 1992; Granovetter, 1995).. He studied how people found out about jobs available in a community. He compared the use of *weak* ties, those relationships of acquaintance, which may not be activated very often, with those of *strong* ties, such as friends and family, and found that those people who had many weak ties had much better access to information on jobs 'through the grapevine', than those who only had strong social relationships. This research came at a time when many were lamenting the breakdown of the local community, atomisation of society, and the loss of the close community. It also showed up 'class' differences: the working class people with close supporting communities could not tap into the weak ties and broad social network that many middle class people had access to. He concluded that 'the importance of weak ties is asserted to be that they are disproportionately likely to be bridges, as compared to strong ties, which should be underrepresented in that role' (Granovetter, 1982). Whatever the issues of social 'class', weak ties can serve a useful purpose both for bridging groups to other groups, and for the individuals who maintain those weak ties.

[73] The sharing of opinions and attitudes is an important area in social psychology. Shared attitudes often arise from social proximity. Festinger showed the importance of informal groups in resolving ambiguous questions (Festinger, Schachter et al., 1959). We turn to each other for help in resolving issues of uncertainly, arriving at a common understanding of a situation. From this it would appear that social cohesion, communication between those in close social groups with strong ties would be a key feature in the adoption of innovations

[74] homophily = population with same values, view of the world - homophilious population makes communication easier; heterophily = different value system, different language - heterophilious population makes communication more difficult.

[75] Gatignon and Robertson thus equate strong ties with homophily (Gatignon and Robertson, 1991), Johnson Brown and Reingen do not equate them, but suggest they are just linked (Johnson Brown and Reingen, 1987).

[76] (Rogers, 1995) 1983 edition still does this!

[77] Altogether it is a much more sophisticated study than earlier research. Their subject was 'who-told-who' information flow networks for referral to three piano teachers in suburban area, all with similar qualification and standing, with a group of 85 families, including parents and children. To simplify this problem this is subject that is not a product promoted in the media, so there were no 'media effects' to influence adoption .

[78] What they found was that the topic (good piano teachers for children) came up in conversation between people who saw each other regularly, whereas with people they knew less the subject would have to be raised specifically. They found that strong ties were much more numerous as sources of information, in contrast to other studies (Granovetter, 1973) which had weak ties as being more numerous. This could be because information exchanged was not about an innovation new to the community, there was no need to go to weak ties for information, as it was available from strong ties.

[79] "though networks members can exchange information, vicariously experience others' behaviour and others legitimate changes associated with and reduce uncertainty about an event, idea or phenomenon" (Rice, 1993, p.49)

[80] Role of Physical proximity is a primary issue in geography (Cliff and Ord, 1973; Cliff and Ord, 1981) at various levels, from country or region to individual. Physical proximity, even when it involves no social network connection allows people to see technology, engage in vicarious use and witness consequences. This is modified in cohesion and structural equivalence to include role of the media (Burt, 1987). (Problem today is not getting access to the information, it is 'finding way to ignore as much as possible of the otherwise overwhelming horde of facts" (Klapp 1978, Opening and Closing, NY CUP). Taking information access for granted how do we make proper use of the information.)

[81] Burt, (Burt, 1987) investigated the influence within a closed network that had been the focus of one early diffusion studies Coleman's study of Physicians (Coleman, Katz et al., 1957). Coleman had studied the diffusion of one drug in a community of practitioners, and concluded that informal conversation between doctors was central to the diffusion of the drug. He compared two models of social contagion or influence - cohesion - via conversation with close colleagues (WOM), or structural - perception of proper action for occupant of their position in social structure of colleagues. He concluded that while social influence was not the most important factor in adoption, structural and cohesive influences were inter-linked, one being more important than another depending on the diffusion of the innovation. Structurally equivalent people have same position in social structure, and similar relations with others. While cohesion can be seen as cooperation, Burt saw structural equivalence as bringing competition into the equation. However it is possible to see that adoption in equivalence occurs when we see that an innovation is relevant to others in similar situations to ourselves. Burt also suggested that the more prominent physicians were less influenced by their cohesion group (or *alters*) than others were, however they had a strong influence on this group, particularly when they resisted adoption. Other related research has been done by (Rice, Grant et al., 1990) on the adoption of electronic messaging systems, looking to understand the way that the network influences adoption, and the role of individual attitudes.

[82] It is worth going back to the original work on opinion leadership by Katz and Lazerfeld (Katz and Lazarsfeld, 1955) which was conducted in local communities of women in the USA in the 1950s, looking at various product groups, including fashion, current affairs, movies etc. They found that opinion leaders emerge in all areas of interest to a groups. However they also saw that at each stage in the life cycle opinion leadership has different importance, for example younger people were more likely to term to opinion leaders than older people. They also found that opinion leaders are among the more gregarious in a social groups, but not necessary of higher status. "The power of opinion leadership in the kind of face-to-face influence situations which we are concern [with] .. finds expression in informal persuasion and friendly influence, which probably does not derive from wealth or high position but from casual everyday contact with peers" (Katz and Lazarsfeld, 1955) p.325 This introduces the importance of the informal and everyday relationship. They also found that opinion leaders tended to be more interested in a particular area than others, that interest was only

converted into opinion leadership when others in the group were interested too – they are more likely to be opinion leaders because they meet people regularly who want advice.

They also looked at where people looked for social influence in their network. Although they were cautious in their conclusions they raised the issues of influence within and outside the family. Outside the family they saw that social influence on consumer products was mostly within peer groups of similar age, or similar status, but within the family there was a range of influences across ages, and between those with different roles. This influence was very much dependent on the particular product, and whether it was "culturally certified to the domain of particular household members" p. 329. The family and external groups were linked together, with family members looking to groups outside for some products, such as children asking about movies and many household products (where peer kin groups were consulted). They also noticed that there was a role for the 'expert', someone with exceptional knowledge who would often be outside the usual social group. They found that for particular interest areas there were opinion leaders within different groups, such as family or status groups, and different individuals would play this role of different interests. They found very little evidence for individuals being general leaders in a range of areas.

This work, which has been much investigated and criticised since, shows some of the basic themes in personal influence and opinion leadership- that opinion leaders are made by the interest of those around them as much as from their particular expertise, the use of opinion leaders varies with the particular group, and stage in the life cycle, and with the subject of interest, and opinion leadership is based on informal everyday and friendly communications rather than on formal interaction with those of higher status. What they have been criticised for is their two step model of mass media influence, where the opinion leaders are seen as mediating the mass media messages, rather than the more sophisticated model where everyone balances media influence with personal influence.

[83] (Venkatraman, 1990) investigates two different theories of how opinion leadership relates to product involvement, based on a psychological trait of 'opinion leadership'. People who manifest themselves as opinion leadership in their relationships with others participate in opinion leading activities such as information sharing and innovative behaviour. However is opinion leadership behaviour the result of enduring relationships with a particular class of product – spending time searching for information and adopting early manifests which itself as enhanced opinion leading (a *moderating* influence of involvement), or is opinion leadership a personal characteristic that *mediates* the way that those involved with certain products interact with others. Venkatraman tentatively suggests that the mediating relationship is more important: enduring relationships with certain products make it more likely that people will be measured as having opinion leadership traits, and engaging in opinion leader activities, rather than opinion leadership being an independent personal characteristic.

[84] Obviously close family ties, and the workplace organisation are dominant, but other types of network, such as local community, friendship networks, and extended family network exist too. The 'community' as a geographically based-network of structured relationships has been the subject of much investigation and controversy at various times in recent years (e.g. (Crow and Allan, 1994; Allen, 1996) – first lamenting its breakdown, blamed on population movement, mass media, decline in religious belief, break down in the family etc (Bell and Newby, 1974)), and then reinstating it, but in the light of gender critiques and new research methodologies. This reinstatement came with the introduction of social network analysis which could go beyond the preconceived structures of the local community to look at informal networks. This brought the realisation that new forms of community were being developed (Fischer, 1977; Davies and Herbert, 1993; Crow and Allan, 1994; Allen, 1996; LeGates and Stout, 1996) and the local neighbourhood community is only one dimension of our personal support network which spreads far wider than the local area, including the nuclear family, extended family, work colleague, friends near and far, including the idea of the modern tribal group – a network within a greater mass of people Just as traditional local

communities were seen as providing a support, such as in Bott's classic study of East End families (Bott, 1955), now these 'personal communities' have been shown to do the same (Wellman, 1982). The 'weak ties' research was also showing that large, weak social networks could provide certain support in a modern society that traditional close relationships could not. One hypothesis is that community has been 'privatised', that is, it has shifted from something that is based on communal and public spaces, where it is highly visible, to being based around the home, a much more personal and private space (Wellman, 1982; Crow and Allan, 1994). Particular empirical work has influenced this thinking, including the work on the development of the nuclear family, compared to the extended family embedded in a traditional community. The nuclear family is seen as the focus of social ties and community support as the traditional community breaks up (Bott, 1955), which in turn leads to more stress on the family relationships in times of hardship. In a traditional community ties of marriage and romantic love and parenthood were not the uniquely important relationships of our lives but integrated into many other support and power relationships (This is at its most extreme in traditional village communities). Today the place of the extended family is in question as a support network, with friendships being frequently claimed as the 'new family'(Allen, 1996).

[85] The family is far from a monolithic concept, as many families dissolve and merge, and the meaning of all the relationships change. The relationship of marriage has changed, although it certainly maintains strong gender roles. Access to kinship networks has also changed with labour mobility, but is still very important. Primary kinship is central to caring and support. Work, gender and domestic circumstances all shape the way we are able to make and maintain friendships, and the value they have, being constructed around our social location and social identity. Friendship is of course used for sociability, but also for practical and emotional support and for confirmation of identity (Allen, 1996). Friendships often involve a high degree of exchange that makes similar social status (homophily) an important factor so that exchanges can remain on a roughly equal level.

[86] Colin Bell found in a research on two housing estates that gossip has very important to the life of the estate, and very useful for putting together the structure of social relations in the communities. He looked at who was gossiping, and what about. He found local and non-local groups formed separate 'gossip cells' (West 1945). Kinship information circulated, as did information about a man's job and position, a key to social mobility . Bell looked at the role of gossip when a public event occurred – how different groups took sides, and considered the others within their groups. Reflecting on the apparent break up of community he concludes that even in what is apparently a face-less community there are always face-to face communications and social processes – and events bring out these social process for the investigator. This highlights that importance of looking for common events in investigating social relationships. In 'Use of Gossip and event Analysis in the study of suburban communities' in (Bell and Newby, 1974)

[87] There are other important types of community too, based on the workplace, professions, the old-boy network, political parties and particular interests such as hobbies or civic activities (A gender reading of this shows that these traditional the focus of male communities, based on activities outside the home). In the workplace, for example, the social network is generally formalised, but there are also an informal networks that run parallel. The way these interact, and complement each other is very important. Some business methods try to discourage informal networks and community support outside official channels, while others promote teamwork, friendship, personal commitment to others etc (The introduction of e-mail in firms promoted different responses to the technology depending on the tendency of the organisation – some tried to repress e-mail communication 'behind the backs' of formal channels, others activity encouraged it e.g.(Siegel, Dubrovsky et al., 1986; Kraut, Fish et al., 1990)). Other communities, such as old-boy network have specific unwritten rules and formal institutions.

[88] While communities are traditionally seen as focused on important shared concerns, such as the family, local geography, formal organisations, other common interests may not be the

basis of community, but are very important in sustaining informal social groups and passing relationships. Sport is seen as a neutral common interest for many men, from whatever background. Family, soap operas etc have been shown to be common points of interests for certain groups of women (Allen, 1995). The same can be said for youth fashion and cultural interests for young people.

[89] It is not only technology that enables us to hold these communities together – but there development of city centre meeting places, over local community centres, and leisure activities that bring together dispersed communities.

[90]The argument is that since we no longer have to rely on local communities, we can ignore them. This leads to the break down of those communities, and the total exclusion of those without broader community links. Those without the resources and skills to use communications technologies are at a significant disadvantage. This is discussed in the section on social exclusion.

[91] National special interest groups, single issue pressure groups etc., have developed using on traditional media and telecommunication systems, and are flourishing with new media creating ever more connected but geographically diffused networks. [91] The beginning of the 21st Century saw some spectacular examples. In the UK the 2000 Petrol Protest was arranged and coordinated within weeks using mobile phones, and an informal network of truck-drivers and farmers. The Internet and mobile phones have been very important in the organisation of anti-globalisation protests around international summits. The organisation power this gave to the protests was far beyond anything that the police had had to deal with before, as they now had to tackle people with tools previously only available to government organisations. New communities that never existed before are developing around even the most rare and hidden interests – most worrying include paedophile rings and worse, where previously contact between individuals was very rare, but they can now find support and community over the Internet.. While many interest groups, which may even be called communities appear to exist in a purely virtual form, much use of communication and information technology acts as a support for ‘real’ communities.

[92] These include mapping tools develop from the 1970s that classify postal districts according to demographics. These include the US PRIZIM and the UK ACORN systems (Statt, 1997)

[93] Di Maio (Maio, 1997)uses the theory of Schwartz (1992) about the universality of human values to try to see if attitudes to interactive services are shaped by values. These include self-direction, stimulation, hedonism, achievement, Power, conformity, Security, tradition, Benevolence, Universalism and Spirituality. She found strong links in a survey in Italy, between attitudes to new technologies and certain clusters of values.

[94] The concept of Attitude “is probably the most distinctive and indispensable…in contemporary American social psychology” (Allport 1954 p.43) quoted in (Hewstone, Stroebe et al., 1988)

[95] This is a central area of research in consumer studies that can be summarised with reference to (Chisnall, 1985). It is also used in study of technophobia, covered in a later section. Attitude is the “orientation towards and away from some object, concept or situation, and readiness to respond in a predetermined manner to these related objects, concepts or situations” (Hilgard and Atkinson, 1967) quoted in (Chisnall, 1985), “a hypothetical construct that intervenes between observable, antecedent stimuli and subsequent behaviour” (Hewstone, Stroebe et al., 1988). However general attitudes do not seem to be a good guide to actual behaviour or even specific opinions (Wells, 1980), but this can vary depending on the situation (Hewstone, Stroebe et al., 1988). There are a number of sources of attitude, put broadly: information exposure, group membership, environment and ‘want’ satisfaction. Attitudes may not be so important for adoption behaviour, but they seem to shape the acquisition of information.

[96] These attempts to classify people may be more sophisticated, and capture some broad trends in consumption and values, but they also fail to capture the contradictions in many

people's lives, the tensions between values, activities and commitments. In terms of marketing to 'niches' it also fails to account for the sophistication of people as consumers.

[97] The concept of lifestyle was developed out of the weaknesses of more traditional demographic approaches to understanding the market I can be summarised as "general attitudes, behaviour towards allocation of time, money and effort in pursuit of particular objectives"(Chisnall, 1985). One of the basic lifestyles approaches is Values and Lifestyles or VALS (Chisnall, 1985). Initially there were two categories of people in the population: *survivors* (struggling, elderly, distrustful, focus on basics) and *sustainers* (hope things will get better, price conscious). These were also divided into those who are *outer directed* and those who are *inter directed*:

inner directed (3 subgroups)

I am me*,* : very young, individualistic, confused on goal, impulsive

experimental*, :* seek direct experience, utility of product important

social conscious: largest group, concerned about simple living, discriminating

outer directed

Belongers : largest group of all groups (38%) conservative, hard working, not innovative buyers

Emulators : 10% US consumers. Upwardly mobile, ambitious, status conscious, conspicuous consumption

Achievers): 21% successful business execs, professionals, competent, comfort loving, materialistic, seek trappings of success

This approach has been widely used by companies and ad agencies. However many people switch between categories, especially when buying and it ignores the fact that many people are a mix of these types, they can change with mood, resources etc. Its potential application to the adoption and use of new ICTs is clear, as it suggests different ways that individuals relate to others and the influence of others, and their attitude to social and technical change, including experimentation and resistance.

The inner directed and outer directed model has been developed. Riesman (Riesman, 1955) suggested three types of social character: tradition directed, inner directed and other directed. Depending on economic cultural and demographics, society made up of one or two of these groups. *Tradition directed*: slow to change, depend on family, narrow values. *Inner directed* – own values, self reliant, inner strength to deal with insecurity and other industry society problems; and *other directed*, who rely on values of others. In impersonal industrial society find expression in developing social contacts, other peoples reactions important. Riesman believed the other directed person was becoming dominant (in the 1950s).

Later lifestyle research bringing in other factors, such as home ownership, social values, purchasing hierarchies important to the particular study. The groups are often given catching, informal names in order to capture the clients imagination. The type of lifestyle groupings used today are illustrated by that of the Research Bureau Ltd, derived from a study of housewives under 45

Young sophisticates
Cabbages
Traditional working class
Middle aged sophisticates
Coronation street housewives
Self confident
The Homely
Penny pinchers

Research Bureau Ltd lifestyle categories (Chisnall, 1985)

Another firm, Taylor Nelson, uses the following categories based on lifestyle and social values: self explorers, social resistors, experimentalists, conspicuous consumers/achievers; belongers; survivors, and the 'aimless'. The Target Group uses a similar type of scale: Trendies 15%; indifferents 18%; social spenders 14%; Pleasure seekers 15%; working class puritans 14%; moralists 16%. (Chisnall, 1985) Problems with lifestyle for market researchers is they start to get too qualitative, and it is very difficult to develop statistical measures for these categories. For the student of consumption they are very useful, as large scale survey data starts to look for the link between more sophisticated social and personal factors than class age or sex. They also show the many different interpretations that can be put on ICTs depending on values and lifestyles. What these approaches do not show is how people see themselves and how these categories are constructed in real life, and why they should be relevant to the consumption of ICTs.

[98] Mary Douglas in (Douglas, 1996) takes a cultural anthropologists approach to consumption of goods, interpreting this consumption not from an individualistic 'needs' basis, but from the cultural preferences and community in which an individual has certain expectations and values. She dismisses the market research perspective, where a person is "encircled by personal needs of greater or less urgency, physical needs first, then social, then spiritual satisfactions" " It is a kind of mad nightmare", she continues, "as if the average shopper were hungry, naked and roofless, and needs first to assure his next meal, then look to his clothes from the point of view of warmth and protection from the cold and rain, then he is ready for his family and their physical needs, and only when all this is done, turns to the rest of the world in a more benignly philanthropic mood" in (Douglas, 1996) p. 113

She proposes that there only four distinct 'kinds of culture' p. 42, that people can find themselves living within, but are by no means forced to remain. She insist this is not an individualist approach, but instead describes communities or social groupings. The central factor in the model is the idea of 'opposition': opposition is required by any community to differentiate itself from others, and members of that community are more aware of, and use the differences from others rather than similarities with each other. She proposes 4 principal cultures:

B Backwater isolation		**C Conservative Hierarchy**	
	Isolates, by choice or compulsion, literally alone or isolated in complex structures (eclectic values)	Strongly incorporated groups with complex structure (e.g. hierarchies)	
	Weak structure, weak incorporation (competitive individualism)	Strongly incorporated groups with weak structure (e.g. egalitarian sects)	
A Active individualism		**D Dissident enclave**	

Each of these cultures is actively hostile to the other, but this "mutual hostility is the force that accounts for their stability", (Douglas, 1996) p.85. However across the positive A-C

diagonal there is an alliance of respect for authority, a separation of material and spiritual values, but a respect for both. These people tend to be stronger in economic capital. On the negative access B-D, she proposes that there is strong spiritual 'coding', which is used against mainstream society from which they are excluded, voluntarily or not.

Douglas applies aspects of this model to interpret changes in fashion and shopping behaviour (Douglas, 1996) p.50 and p.77. Unlike lifestyles models from consumer research propose that people buy into a lifestyle by consuming certain goods, Douglas proposes that what people don't consume is more telling of their kind of culture, and that consumption pattern reflect the values and organisation within a culture.

This theory stresses that people are not restricted to one of these cultural lifestyles, but can move between them, but only at the cost of losing the support of those with whom shared the opposition to other lifestyles (unless of course they come along together). However it does imply that an individual's cultural enviroment will be consistent across different parts of their everyday life. If they do appear to be supporting two conflicting cultural world views, there is possible considerable tension within one of them, as they are forced to live in a community with values opposed to their own. It would imply that people do not have 'split' or 'multiple' personalities, that they wear in different circumstances, but they may have to use specific tactic to maintain normal social and economic relations in relations with cultures that are not their own ((Goffman, 1959), (De Certeau, 1984))

Over the life course an individual may move between cultural lifestyles, changes being associated with major life changes, and periods of appropriation and establishment with a new cultural milieu. Douglas suggest that refuges can suddenly find themselves isolates, or that an isolate can get a job and find the opportunities and resources to move into another lifestyle and change values. Another possibilities is that an individual maintains themselves within a cultural 'mindset' throughout life, whatever the changes. They are able to appropriate and cope with changes and sustain their fundamental values and relationships

[99] Rogers notes that this is ideal, as it depends on perfect diffusion based on information exchange in personal networks. Often the subject is taboo, not discussed, and personal networks are lumpy, and not connected homogeneously across an adopter community. The community also seldom completely adopts – most innovations only reach limited number of people.

[100] The characteristics of these now common commonly used ideal types are described (Rogers, 1995) as:

Innovators: They are venturesome, and adopt outside local peer network. They are dispersed in the community. It helps if they have money to counter losses or risk or adoption new innovations. It also helps to have complex technology knowledge. They often have a desire to be rash and daring. However they may not be respected by others. Nevertheless they can play a 'gatekeeper' role introducing innovations into a system.

Early adopters: These are more integrated members of society. They have a high degree of opinion leadership and people look to them for advice. They can thus act as a *local missionary* and maybe *a* role model. They knows how to remain in central place in communications in a network, and make adoption decisions that will be respected. Within a community they supply subjective opinions, thus reducing community uncertainty

Early Majority These people seldom hold leadership roles. May take some time in decide, but follow happily.

Late Majority. These people are more sceptical of innovations, and adopt them when there is an economic necessity to adopt, such as, as result of network pressure. They need a system of norms to favour adoption. They have less resources, need more certainty in their adoption decision.

Laggards No opinion leadership, localite, near isolates. Past is the reference. Interact with others with same values. Decision process is slow. Suspicious of change agents and

innovation, precarious economic position. However laggards is not a good name, as they may be pro innovation, but have no resources, the often system is at fault, not individual

[101] (Hirschman, 1980) suggests that a basic psychological trait of *novelty seeking* involving the search for new information and experiences, including vicarious adoption and experience as well as actual adoption and experimentation. Then the process of *Role Accumulation* is also important: taking on new roles, such as a new job, a family, presents new activity and consumption problems and acts as a trigger or motivation to solve them. Finally, *creativity*, "the problem solving capability possessed by the individual that may be applied to toward solving consumption-related problems" (Hirschman, 1980) p.287. Creativity is posited to stem from the 'interconcept network' of a consumer, their depth and range of experiences that can be connected to solve problems, and form the consumer's repertoire of consumption situations and the *scripts* developed to solve problems. The more creative consumer, generally the consumer with most experience of innovations, is much more able to engage with innovations. This concurs with other evidence that consumers with more experience of a product class are much better able to assess and deal with innovations in that class. Many studies have found that "innovators are drawn from heavy users within the product category or from those with significant experience of similar product categories" (Gatignon and Robertson, 1985), as they have more information and are better able to make predictions of the outcome of adoption.

[102] As an example of how this framework could be usefully applied, Hirschman suggests a study of the adoption of the home computer. In a community one will find three nested groups: 1) people who never gain awareness of the product, 2) vicarious innovators, who are exposed to the technology, and seek out information on it.3) and from this group, some who become actual adopters. To understand why some of the vicarious innovators adopt, we can look at role accumulation, such as new activities and roles that present the consumer with a need to innovate. The creative consumer will them be able to draw on their experience to generate a range of possible solutions to the problem, one of which may be the home computer. Their creativity, based on experience of IT, does not mean they will adopt, but enables them to consider the option effectively. Their creativity will also enable them to envisage innovative uses for the machine before adoption. This approach to classifying consumers makes the concept of 'innovativeness' more complete and operational in the research context.

[103] Pierre-François Clerc and Philippe Mallein of CAUTIC based at the University of Grenoble.

[104] They identify four groups in a similar way to Rogers.

The 'passionates'	Change (rupture) Fashion makers Change for change sake Utopia in near future Risk taking Leave innovation when bored
Pragmatics	Opportunism Maximum efficiency Functions for 'doing things' Change accepted Risks are controlled and managed Past success gives confidence

The Followers	Wait and see Efficiency important Functions for 'managing' things Continuity Avoid ruptures Risks avoided Normalisateurs? Put off decision
Objectors	Conformity and inertia Anchored in tradition Decisions 'aleatoire' See the future as the same as present Anxiety at change Fear of risk

CAUTIC classification of technology users

[105] Dholakia *et al.* .(Dholakia, Mundorf et al., 1996a) point out that there are four major practical constraints or barriers to adoption: money, time, space and skill.

Money resource: adoption of new technologies increases dramatically with income .(Dholakia, Mundorf et al., 1996a) p.10. People with more money are not only able to afford new technologies, but are also to stand the risk associated with uncertainty over standards, potential benefits, reliability etc. However as technologies develop there is often a range a products in available, so those with less money can buy cheaper versions. Money can also shape the way we use products, such as the time on line.

Time resource: for specific market segments time is more important than money. Some technologies are bought because the save time and enable many things to be carried on at the same time (buying time). This is referred to a polychronic use (Kaufman, Lane et al., 1991) in (Dholakia, Mundorf et al., 1996a). Those with little time will look for time saving devices, and not have time for time wasting products. This also implies that products that need time to learn are not attractive.

Skill resource: Many new ICTs need the development and use of specific skills and expertise. Some people do not have these, and may not have the resources, experience or scripts (Hirschman, 1980) to enable them to do easily. Technology literacy developed from education and experience maybe necessary to make adoption and use practical. In this case people turn to others more expert for help, or delay adoption until simpler versions are available. However having the skill does not mean it will be used, as those who are heavy technology users at work may choose not to have to deal with machines at home.

Space Resource: Technologies take space, and this can be at a premium and contested in many homes (Silverstone, Hirsch et al., 1992). With a proliferation of technologies that do not have an accepted place in the physical and social space of the home or office, adoption and use becomes a problem. It many not be an issue for one unit, but with multiple computers, televisions, and associated wiring being adopted for each person the technology starts to become overwhelming

[106] Only by having a pro-innovation bias does the adoption of an innovation seem to proceed smoothly through sequence of stages such as that proposed by Rogers. However as we shall see, resistance and rejection are just as likely at any point. In fact one could say that for all but the most passionate, there has to be something that triggers adoption. Traditionally a need has been posited as necessary for someone to adopt, where the innovation satisfies a need. However we can invent almost limitless needs and limitless solutions. Hirschman pointed towards one factor that could be important – *Role Accumulation* – when someone takes on new activities and responsibilities and looks for a way to cope with them. In these circumstances people will then adopt. Parallel research I did with this project concerned the use of cybercafes.(Stewart, 2000a) A survey of users of three cafes revealed that there was normally a special event that made them start to use the café. I introduced the concept of

triggers to use to examine what makes people start to use and continue to use the facilities of the cafe, and continue to use them. Four main categories are suggested: 1) Life Events; 2) Social Push; 3) Multimedia Pull or Instrumental need; 4) Curiosity and Interest in technology or content. They are all reversible. These triggers are useful categories to understand not only why an individual might starting using a service such as a cybercafe.

Life events: These are changes in occupation or circumstance of an individual, or in that of friends and family and other personal social network members, that creates 'need' or force a need on someone. The technology may be a solution to a new problem or barrier, or a new obligation. Among life events one of the principal changes are those related to travel, which reflects the increasing global mobility of many people. More people travel today, and longer distances, and technology now allows us to keep in touch with personal and professional social networks across the globe. There is undoubtedly a large number of people whose participation in the 'global society' and 'global culture' is not just as consumers of goods and media from around the world, but as active members of global social network. Several of the customers who previously did not use e-mail, or even computers, and have no other use for them, found the cybercafe the only way to keep in touch. Many tourists and visiting business people came to cafes ; all the cafes had long term immigrants visiting to mail home or read home newspapers. Several people started to use e-mail and computers for the first time because they had made friends abroad, or a girlfriend or boyfriend had moved away. Other life events include changing jobs or leaving college and being deprived of an Internet connection or computer access.

Social Push: The adoption and use of multimedia is a result of being introduced to the technology through other members of a social network, and using it with or because of them. Many people come to cybercafes on recommendation from friends, or with friends to pass the time. Some cafes had most of their customers through recommendation, and many of them came to play games with friends. Parents came in because of the their children, and grandmothers had heard about their grandchildren using the Internet.

Multimedia pull - instrumental need: In these cases technology that a customer owns or has access to is no longer sufficient for the purposes they want it for, or they are restricted from using certain functions due to economic or external social constraints (e.g. restrictions at work). The trigger is primarily instrumental need. Many people using cybercafes have their own computers, but do not have Internet connections: either they can't afford them, or do not wish to spend money on something they use only occasionally. The gamers especially need more power than their home computer can offer, and get the network connection to play the games against friends.

Curiosity: *and engagement*: Some people develop an intrinsic interest in new technology or multimedia, a curiosity which they wish to satisfy, with no particular goal apart from developing knowledge about the system or particular content or application. Even without using it, multimedia has become part of most people's life today: These people were looking for the opportunity to change this awareness into a more concrete knowledge through a hands on trial.

In the cases of cybercafes those people who used them did so because they were relatively easy to trial, they made the technology observable and convenient to, according to Rogers' criteria. However we always have to judge the technology in the context of the *resources* available to an potential users

[107] With obvious methodological caveats.

[108] A number of authors have looked at religious groups that reject or limit use of technologies. Two of these are a studies of similar fundamentalist Christian groups in the Netherlands (Renckstorf, McQuail et al., 1996) and in the US (the Amish)(Umble, 1992).

[109] A non-adopter could be rejecting an innovation outright, or be going through a process that may eventually lead to adoption of a later or more developed version. A non-user, who has rejected an innovation, may have trialled it, adopted and discontinued use, or found a

preferable alternative. There are also degrees of non-use of an innovation that do not rule it out completely, such as the partial, or restricted use of an innovation, behaviours that could be classed as type of use as much as types of non-use. A non-user is not necessarily someone who is ignorant, or unskilled in the use of an innovation. They may have a sophisticated knowledge of how and when to use it, but never have the need or opportunity to do so, or prefer to keep it out of their lives.

[110] Such as social resistance of groups on moral grounds (ibid.) or defending special interests

[111] . His article and volume 'Resistance to Technology' is mainly aimed at large scale movements of resistance, but also looks at the individual and small scale as well (Bauer, 1995a).

[112] First, resistance can been seen as diversion from the 'one best way'. (Bauer, 1995b, p.13): we all should learn about and use ICTs because they have so many benefits, and they are so interesting! However beauty is in the eye of the beholder. The demonstration of bounded rationality shows this is wrong: we all may have very different ideas about what is the 'best way', rejection is not irrational, but from our own rationality, relevant to our own life context. (Szmigin and Foxall, 1998) and (Mick and Fournier, 1998) concur that rejection is not a negative factor, but a result of rational choice on the part of consumers given their knowledge and circumstances.

Second, there is a difference between resistance and *opposition*, which occurs within a system: opposition is expected, it is built in to a social or corporate system. Resistance is outside the system, and is more unpredictable and risky. Resistance involves 'violating norms: in our case, refusing to use ICTs in a situation where everyone else is using them could be risky for employment, cultural and social inclusion etc. Within society there exist different norms, so refusal is often based on tastes, or distastes of technology[112] (Bourdieu, 1984, Douglas, 1996 #72; Dobscha, 1998; Fournier, 1998; Hogg and Savolainen, 1998). Opposition to participation in the 'consumer' society is likely while a technology is still diffusing. However as we see ICTs becoming ever more ubiquitous this opposition becomes extraordinary and risky resistance, and may start to cause problems, as is highlighted by concerns over exclusion (Stewart, 2000b). Third, Bauer suggests that the motive for resistance does not have to be acknowledged, and can be *avoidance behaviour*. Many people will avoid an innovation, or not adopt or consume because it takes no effort to do so. If one does not have the means or knowledge to adopt, the result for the promoter of the innovation is still resistance. Resistance by ignoring was also found by (Mick and Fournier, 1998).

[113] Szmigin and Foxall (Szmigin and Foxall, 1998) propose 3 types of resistance in their critique of the idea of laggards in the adoption of debit and credit cards: *Rejection, Postponement,* and *Opposition*. Mick and Fournier (Mick and Fournier, 1998) look at a number of pre-acquisition behavioural strategies that people use to avoid the 'paradoxes' of new technological products that they might have to deal with if they adopted them. *Ignore*: avoiding information about the characteristics or availability of certain technological products; *Refuse*: decline the opportunity to own a specific technology; *Delay*: postponing but eventually owning.

[114] Rogers quotes (Eveland, 1979) proposing two types of rejection, active (with trial) and passive (non-adoption, ignoring).

[115] Computer or technophobic attitudes anxiety and behaviour is found throughout society, at every age. However up until now it appears strongest in women as a group compared to men, particularly dealing with the sort of computers that need expert knowledge and are used in situations traditionally dominated by men. However (Turkle, 1996) considered that computer 'phobia' was not the basic the problem, but computer *reticence* - because a computer becomes a cultural and personal symbol of what a woman is not. She proposed the idea of hard and soft mastery*:* (Turkle, 1994), two styles of thinking, hard, which aims to control the world, and soft, to accommodate the world. She suggested that computers and the computing world are dominated by hard mastery strategies. However in the light of the

recent change and explosion in many more easily accessible technologies that are the focus of everyday management and creation, this type of analysis is likely to be in need of reconsideration.

Brosnan suggests that people underachieve on tasks they do not identify with, and this occurs with women labelling computer-based tasks as masculine. An example to show this is the characters in a video game being changed from pirates to honey bears and the girls going from poor performance to a performance equal to the boys. Thus he suggests that the type of task the computer is used for has massive influence on female performance. There is thus little evidence for sex difference in ability, but lots for gender effect. Females who believe computing to involve 'male' stereotyped skills that they are less likely to engage with it. Brosnan concludes that 'technophobia' is entirely based on socialisation effects that manifest themselves as psychological reactions.

[116] A thorough review of the literature on technophobia by Brosnan (Brosnan, 1998) highlights the importance of social factors in the development of the behaviours, attitudes and anxieties that are generally grouped together as Technophobia.

[117] Behavioural reactions include not adopting, avoidance, avoiding talking about computers, avoiding users of machines, passing responsibility to others, making negative remarks about computers and users, avoiding conversations about computers, avoiding media information on computers and technology, being over cautious about use, making poor use of machines and not being innovate. This can lead to exclusion, lack of learning, and limited appropriation if any. Emotional or subjective reactions (recalling earlier discussion of consumption) can accompany these behaviours, but also be associated with actual use*:* these include negative feelings, anxiety, fear, frustration, anger, despair, a feeling of being trapped, but also lack of any feelings of fun, mastery, adventure etc. Finally the attitude of a technophobic includes being negative towards computers in thoughts and speech, having a negative self-image with regard to machines, thinking that computers are not interesting, not worthy of interest, too complicated, or holding negative views of impact on society.

[118] A top-down approach to studying non-use and non-adoption, exclusion from innovation or resistance is to look for groups in society or a market that stand out as non-users. The classifications of consumers looked at in a previous section . This is done by sociologists, looking at, for example, social exclusion, and by consumer and market researcher identifying poor markets, or gaps in the market.

(Bauer, 1995a)suggests a number of types of groups that are identified in looking for those who resist technology. *Natural groups,* those existing groups with some social identity and organisation that resist technology, such as arts elite groups, civil service elite etc (Kling and S., 1988) mention the *counter computer movement* bringing together libertarians, consumerists, trade unions and pacifists who resisted technological change as part of a broader programme. Organised group like this, that promote resistance to innovations, or 'alternatives' to mainstream technology interests also include political parties and religious denominations. There are *vested interests* such as labour elites and 'old capital', those with *'traditional values, social marginality and habitual nay saying'* (Bauer, 1995b), and groups with a tendency to favour 'alternative', anti-scientific innovations such as 'soft medicine' and para-sciences.

Statistical groups include sociological and consumer research categories that group people according to common socio-demographic criteria. These include the middle class (Pakulski, 1993) with a suspicion of technology, low-skilled women, older people. Most studies of the uptake to ICTs and attitudes towards them including 'technophobia' find a bias towards the older, the poorer, the less educated and women as being more likely to fear and resist technology, or not to use or consume innovations.

Other types of groups Bauer identifies include Other studies highlight the differences within corporate hierarchy, older studies ((Lawrence, 1954; Johns, 1973), quoted (Bauer, 1995b)) that show more resistance to technology among lower ranks, but with the development of IT, middle managers emerging as innovators while business leaders are more resistant.

Finally in the consumer market, there are groups who do not purchase or 'under-use' products, which may be an indication of resistance, but can equally signal uselessness of products to those individuals.

[119] *Psychological ambivalence* in normal people is the simultaneous experience of pleasant and unpleasant feeling for the same object: it is not surprising that [complex objects] have the capacity to attract and to repel, to excite and to inhibit, either successively or simultaneously (Rosenzweigs 1938 in (Otnes, Lowrey et al., 1997)). *Sociological ambivalence* 'focuses on how external forces, such as the existing social structure, can be sources of mixed feelings' (Otnes, Lowrey et al., 1997, p.81). Here, locally defined social roles are in conflict and we experience ambivalence as we try to reconcile them. *Cultural ambivalence* arises from conflict of cultural values. (Otnes, Lowrey et al., 1997) finds a number of conflicts in the purchase of wedding dresses.. For example when there is too much information and choice, one can simplify the choice, or do extensive information search, or when there is a conflict of vision, one can compromise or give in or be defiant

Conflict	**Coping Strategies**
Of expectation v. reality	Merchandise return Getting the money back on an unwanted product Change purchasing venue For price, service etc Toughing it out Put up with problems
Product overabundance Task overload Too many things to do	Simplification Attempt to minimise the fuss – buy reducing items, going to an on-stop-shop Seeking assistance Bring in others Extensive information search
Clashes of vision Over interference of others in decision. Clashes over roles, perceptions, and expectations.	Resignation Giving in to demands of others Compromise Have to give some way, but not all.
Resistance to Custom Desire for Self –expression	modification use traditional objects in a non-conformist manner defiant non-purchase

Conflict and coping from (Otnes, Lowrey et al., 1997)).

[120] An adopter would generally have expectations of the product or service they are going to adopt, and not necessarily all positive The non adopter does not adopt, partly because their expectations are low or negative. Expectations are linked to the product itself its supposed functionality, costs etc judged according to Rogers' framework; on the context of adoption, whether it professional, domestic, private, enforced or voluntary etc; on previous experience with technologies; on the influence and experience of others; on media reviews etc. There are four obvious groups of expectations when there is the possibility of adopting an innovation.

- Positive expectations of adoption/innovation
- Negative expectations of adoption/ innovation
- Positive expectations of non-adoption/
- Negative expectations of non-adoption

These are not the same as reasons to adopt or not. For example someone may not adopt for lack of money or opportunity, and still have expectations of what adoption may bring, and what not being able to adopt means.

In practice these expectations of an ICT could be positive:

- Productivity improvement – professional, domestic, social (control, integration)
- Improved management of time, relationships (control, social network)
- Improved quality of work
- Satisfaction of being an owner/user – of owning/using, of being part of owning/using group (facilities, awe, classification,)
- Opens up opportunities – for self development in life projects, relationship with others.
- Chance to be up-to-date, modern. (life theme)
- Discovery, learning

There are also negative expectations for owning or using:

- Struggle to learn to use
- Living with malfunctions
- Costs of ownership – repairs, replacement, spiral of investment
- Possible dependency on the technology
- Not be able to use well
- Bad for others who might use product
- Replace other activities
- Dissatisfaction with being a user/owner (classification)
- Get exploited by others (employer, advertiser, friends, co-workers)
- Vicious circle of pressure to be more efficient, work harder, work longer (employer exploitation)
- The expectations of non-adopters (those who do not go on to adopt, or do not consider adopting) Expectations against adoption
- Would not help any activities (professional, domestic, relational), would not be useful, used
- Cost too high – even if other expectations are very positive.
- Unable to use, or learn to use
- Get hooked – slippery slope
- Interfere with other activities (waste time, destroy other investments e.g. relationships)
- Bad influence on others, bad for others who would use
- Feelings of inadequacy – would be too much, overwhelming
- Pressure to be more efficient, work harder, work longer
- Bad image of product and of users - nerds, yuppies (classification)
- Giving into the desires, expectations, demands of others

However we must be careful not to develop a technology bias. In many situations adopting or using a technology may be a choice to balanced against non-adoption, or even demand active resistance. Non-adoption is not a neutral way, the positive and negative expectations of not adopting have to be weighed too. The non-adopter may have expectations about the positive benefits of not adopting in a situation where many other people are adopting. Again these depend entirely on the context.

Positive expectations of not adopting

- Able to keep independence, from technology, from others, from ‘capitalism’ (control)
- Be part of non-user group (classification)
- Not obliged to learn new things
- Can focus on more valuable activities
- Not have to carry the cost
- A non adopter many also see negative aspects of not adopting, but still not adopt, for whatever reason such as feeling they will lose out.

In the longitudinal study it is possible to see how these expectations are met, modified, never appear and the completely unexpected appears – this is the area covered by the work on satisfaction. Domestication and Consumption analyses show how these expectations are constructed, and how and if they are fulfilled.

As well as personal expectations and satisfaction we can also look at expectations for other people, since adoption and use are not individual: we share them. Parents expect children to need computer skills, so will invest for them. They may also expect video games to distract them, so they don't buy a video games console. A company manager may not let employees use the Internet expecting them to waste time; we may expect that an unemployed friend could get a job if they did some computer training.

[121] Mick and Fournier take a number of established models of satisfaction, and from their phenomenological studies they find them lacking. Their review is summarised briefly here.

Expectations- Dis-confirmation model : Mike and Fournier discovered that although there was initial dissatisfaction with products if compared with original expectations, these were relatively unimportant compared to satisfaction from *unexpected usage and benefit* ((Mick and Fournier, 1995) p.21). Benefits are not only in terms of practical uses, but also symbolic meanings, such as the computer use reflecting positively on the professional self-worth of the salesman. These symbolic factors appeared important in relation to American cultural myths (also (Arnould and Price, 1993), (Hickman, 1988)). One of these is 'Awe' at the machine: the machine does its job well, but the power of the machine (a computer and bread maker in their case) appears to the principal source of unexpected satisfaction. Mick and Fournier also focus on the negative expectations – how satisfaction can be gained by a technology not having the expected draw-backs (e.g. demands of the telephone answering machine, expectation of car breaking down). The negative, or dark side of technology is a common 'myth' of technology and pervades all expectations about innovations, so an anxiety-disconfirmation factor may be widespread.

An Equity model links satisfaction to the value for money that the customer thinks they are getting from the retailer. If the product was cheap, the retailer downmarket, then the product is not expected to last long – there is satisfaction when it does. Alternatively if a product does not work well, then the customer can feel aggrieved at the retailer because of the unfairness of exchange, especially when there is an actual reduction in quality of life after purchase.

Experience-based norms model. This model is based on a cost-benefit trade off, with satisfaction coming from reaching a certain level of benefit. Mick and Fournier extend this and suggest the importance of reaching *dependency*. Many products are satisfying because the benefit is so clear that we come quickly to depend on them. However this demands a certain level of *trust* of the product Dependency is not always positive, and this comes out not in respect to satisfaction with the product in question, but in relation to alternatives, e.g. the lack of public transport, the cost of repairing cars. Dependency can also lead to *helplessness or resignation* that is linked strongly to a reduced quality of life.

The Desires Model. The desires model sees satisfaction as a function of the assessment of whether the outcome matches desires. Desires are the levels of product attributes and how these will lead to higher-level values such as longer life etc. Mick and Fournier criticise the importance given to rational reasoning processes by consumers, instead highlighting the less rational and affective processes. *Life themes* and short term *life projects* are the basis for the satisfaction, but these are often sub-conscious to the rational assessment of desires and their satisfaction. Mick and Fournier find examples of developing a strong emotional relationship with a technology – a satisfaction mode of *love*, there the technology satisfies desires to a significant degree, promoting deep feelings or intimacy and commitment. This tends to develop over time and is often unexpected. They also point out unexpected outside factors can reinforce this as they make it clear that one has made the right decision to adopt.

The Attribution Model uses the causal explanations people give for everyday events and the effect of these explanations, including emotions such as satisfaction (Weiner 1986). People are satisfied when they can attribute their own actions to positive outcomes, and dissatisfied when externally controlled factors produce negative outcomes. Mick and Fournier give examples of kitchen appliances breaking down being blamed on supplier causing considerable dissatisfaction, and a non-functioning washing machine that was found to have failed because of a family member pressing two buttons at once, where dissatisfaction was minimal. They found alternatives to the accepted model that people try and blame other for dissatisfaction, and themselves for satisfaction. Feelings of incompetence and technophobia that are personal can be blamed for dissatisfaction, and suggests 'how technology experiences can signal one's age add reduce self-esteem making older generations feel inept and left behind". (Mick and Fournier, 1995) p.36. However the attribution model was not particularly important for technologies because of the widespread view that technology products are *expected to fail* at some time.

122

Functional tool	Toy/world to be explored
Efficiency	Curiosity
Simplifying	Attachment
Utility	Engagement
Time saving	Time filling/well spent

Computer, Tool or Toy (Aune, 1996)

123

Mastery/complete knowledge	Minimum knowledge
Control insecurity	Save time
Curiosity and self expression	Lack of curiosity
Control technology	Efficiency
Maximum efficiency	Mastery not part of self image
	Technical Insecurity

Mastering the technology

[124] http://www.stepping-stones.de

125

Reasons for adoption	
Communicating:	43%
Special information	41%
General information	36%
Keep up to date	35%
Good way to make money	28%
Banking	17%
Meet new people	16%
Shopping	10%

Reasons for Adoption (Katz and Aspden, 1997).

126

How were you originally introduced to the Internet	University course	Other formal course	Self taught	Learned at work	Taught by friends or family	No. of respondents
Former User	16	10	13	15	46	144
Recent User	9	6	27	28	30	308
Long term user	19	7	22	35	18	293

Original introduction to the Internet in (Katz and Aspden, 1997)

This table shows that the split between self taught, being taught formally or work, and through friends is about equal (Other formal course included : school (21%) Magazines/brochures (13%), through e-mail (10%), (44%) other, (10%) don't know). Former users (Katz is not quite clear what constitutes a former user – is it someone who once had a go, or a long term user, such as a student who left college.), figures suggest people that do not have to use the technology are highly reliant on the friends and family. What these results do suggest is that While there are ways to first 'get on the net', the technology is constantly evolving and full of problems, so asking advice is an important factor in use. Katz looked in more detail at where people go to for advice with the question: When you have a problem, who do you turn to first for help? 35% turned to personal friends, 24% to colleagues and 40% to formal services[126]. However when asked who was the last person to help, 39% said co-worker, 16% friend, 14% a relative and only 16% a specialist. Long term users more likely to use a colleague, recent users, more likely to consult a relative (possibly reflecting the growing in domestic use in recent years) (Katz and Aspden, 1997).

[127] Although of course this is with hindsight.

[128] Technical and Industry Barriers:

- Primitive software
- Lack of telecoms connectivity
- Lack of understanding of computer vendors of households
- Inapplicability and inappropriateness of industry model in home.
- Perception by household users of no major role for computer in home (low strategic value).

User and Use Barriers

- Most users saw computers as job orientated, even at home. Facilitated home working, but also ate into private time.
- More used by those with telecoms links.
- Limited use for stand-alone machines. Most existing stand-alone devices in the home were designed that way.
- Gender bias marked (75% adult male) compared to other communication technology in home.
- Computer linked to nothing else, unlike video.
- No privileged status in household life – not essential compared to fridge, phone, car, unlike in industry.
- No well defined physical or social space for computer. (Venkatesh, 1996)

[129] The development of the 'Smart home' has also suffered from this (Berg, 1996).

[130] Four of the common general concepts have distinct common meanings but converging technical meanings:

The most familiar is the term '*Adoption'.* It implies an individual or community taking on an idea or product, and integrating it into their life. It can obviously be likened to the idea of 'adopting' a child. The literature concentrates on the 'adoption process' – how people find out about a new product, assess it, decide that they want it, and acquire it. Some writers, especially the most influential, Rogers, also include the implementation of the

product into the activities of the individual or community, including its reinvention (Rogers, 1995). The adoption approach is particularly used by those wanting to study the diffusion of new products, and primarily, how to sell them. The implementation and 'afterlife' of the product is not considered, and a linear, rationalist, decisionist model has come to dominate in practice, if resisted in theory. The adoption approach highlights the personal characteristics, the social context, the product, producers and change agents involved in promoting adoption and tries to build models of the influences and processes involved (Gatignon and Robertson, 1985).

Appropriation is a term that is used in an approach concerned with the way that a product is integrated into the activities and relationships of a community – highlighting the changes and the reinterpretation of the product by the new community. It focuses on the context of it's introduction and use, from the perspective of the community, and the product, and to lesser extent their relationship with the producers and change agents. The emerging meaning of the product for the community is investigated in terms of the its existing technical and social culture, as they make the product their own. The word Appropriation has the connotations of 'taking' or taking over and making one's own.

Consumption is a term developed in opposition to 'production' for products in the market place. However it has been develop to cover a particular way of engaging with and using anything. Originally consumption had rather negative connotations – and the consumer was at the mercy of the producer – manipulated and passive. The Consumption moment was also concentrated around the moment of purchase, or the decision to buy particular consumable products especially brands.. Later 'active' consumption was championed – and idea more along the lines of appropriation – when it could be shown the consumers made their own interpretations of products and integrated them into their lives in individual ways (Miller, 1995). In particular, this approach no longer focuses just on the moment of adoption of one product or choice to buy a particular brand, but on the place of products in everyday life and culture whether they be 'consumable' or 'durable'. Currently this is the fashionable interpretation by consumer researchers (Brown and Turley, 1997). However the negative connotations still live on in an ecological or green interpretation – where the consumer society is seen as a way of using resources that is divorced from their source and production and management – where values and meanings are entirely part of culture, and no longer attached to nature. Consumption has connotations of 'eating up' or devouring.

Domestication is a model of the way that products are appropriated and consumed in particular sorts of community – originally the home. It is used to investigate the particular conditions within the household for the consumption and use of media ICTs. The home is a space where the social, economic and material culture are closely interwoven ('moral economy') in a way that is more intricate than in industry or the formal markets outside the home (Silverstone, Hirsch et al., 1992).. The approach points to four dimensions of the process - from bringing the goods in (confusingly called 'appropriation'), the process of their integration into physical and social space, and the way that they then become an integral part of the household unit and its relationship to the outside world. Domestication highlights the changes in the use and meaning of a product after its adoption though its 'lifecycle'. Others have since developed this model (Lie and Sorensen, 1997b) applying it to other spheres were there can be said to be a 'moral economy' – such as the introduction of a new technology into a country (Østby, 1993).

Despite the differences between these terms, in fact they have come to mean very similar things. They are each used primarily in different research disciplines, but as each discipline has developed, they have developed the meanings of these terms. Now the adoption process can be seen as practical and symbolic process, including all the experiences before and after the actual physic adoption moment. Consumption is similar, not only looking at the decision and adoption moment, but the long term use of a single product, and engagement with a class of products. Domestication is no long focused on the home, but looks at the a range of sphere. It also looks at the way that ideas and visions of the product are

appropriated and consumed in advance of the actual adoption of a product. Therefore I decided not to make it a point to only use one term, but to use them interchangeably. This will no doubt upset a few purists!

[131] Interpretative or 'qualitative' research, developed in the 20th century based on the ethnographic research of the Chicago school, especially George Herbert Mead. Herbert Blumer, who developed the ideas of Symbolic Interactionalism based on the work Mead suggests "The task of scientific study is to lift the veils that cover the area of group life that one proposes to study" (Blumer, 1969)p.39. Interpretative research stresses the importance of the individual and intersubjective interpretation in understanding social processes, but also in the actual practice of social science – there is the' double hermeneutic' (Giddens 1976) of the researcher interacting and interpreting Mead (1934) in (Prus, 1996)) the social situation that is being studied. The ethnographic method calls for the researcher to put themselves in the shoes of the other person (Berger and Luckmann, 1966), to share the reality of the 'life-world' of the other. Although a theoretical basis is important, the researcher should use 'inspection' with a great deal of flexibility to investigate presumptions. The social situation should be approached from different angles and be imaginative, free, flexible, creative. Interpretative research stresses the importance of the individual and intersubjective interpretation in understanding social processes, but also in the actual practice of social science – there is the' double hermeneutic' (Giddens 1976) of the researcher interacting and interpreting (Mead (1934) in (Prus, 1996)) the social situation that is being studied. However, what ever the lengths a researcher may go to take the other's stand point they are inevitably going to interpret the social situation according to a formal and informal logic that they bring to the research process. What a researcher should do therefore is to try and make explicit both to themselves, and to their readers is not only the theoretically imposed interpretative window or frame, but the emotional, personal and contingent influences on their interactions with the those whose lives that are studying and on the interpretative process.

[132] Desjeux et al. (Desjeux, Taponier et al., 1997) suggest four main dimension of investigation of the everyday to investigate the link between the social and the technical : *Delegation of responsibility*, to machines, to other people in the social network, and to commercial providers; *Routines; Planning of activities; Improvisation.*

[133] Shopping is an area where there is considerable promise for new technology for home shopping, information gathering etc. There are very different types of use of technology in different retail outlets and for different goods, and different goods lend to mail order etc. Mail order is also an established business used by may people, from books and CDs, to clothes, consumer electronics, white goods, almost anything. The mail order market serves different groups. Catalogues that sell a wide range of goods are generally providing a planned credit service for low income purchasers. Other products such as books and music are sold though clubs and mail order because overheads are lower, and they service a regular purchasing habit. They can also provide a greater choice, and operate on lower overheads than high street retailers. There are specialist mail order services for products that are not normally available except in specialist shops, and mail order companies can offer better prices based on lower overheads and economies of scale from a country wide or global market. There are also more and more single range or brand name mail order services from high street retailers and others, for whom mail order is a form of direct marketing. They run services as a complement to high street operations.

Mail order and use of direct marketing information resources has been a big area of development in multimedia around mass market e-commerce

[134] This is an old chicken and egg debate over what comes first Need or Awareness, some claiming that awareness generally comes through chance encounters, others that it is always initiated and as result of needs driven search (Rogers, 1995).

[135] A network bulletin board and e-mail system popular in education before the Internet became available.

[136] In his model of the adoption process Rogers sees trail by a peer being an important substitute for personal trial (Rogers, 1995) p.168.

[137] "I'm hoping that somebody'll write me a bit of software to do it. I'm, working on one of the teachers here, lecturers, guy that does the C++ programming. Go on Arthur, you'll be able to do that, should be no problem to you (laugh). He's almost hooked actually"[Andy 1 G1]

[138] …Maybe more in work, not in their own social lives, no, but definitely work most people. [Amanda2 G1 : 218 - 218]

[139] "My friend Johnny Cruickshank imports CDs from Japan over the Internet, because he's a real avid collector. I enjoy the buzz of going to a record shop and looking around, so it would take the buzz out of it." [Alec and Neil 2 G2 : 87 – 87]

[140] "Well we're just waiting for Ian to make up his mind and each time he reads another magazine he says something else better is going to come out. So when that comes out there's always something else after that." [Fiona 2 G1 : 49 - 49]

[141] "But the boys have got the computer, my husband's got a computer and my brother has one that does everything but make tea. He's got a very fancy thing and ... and the Internet and all the rest of it and he gets a great deal of pleasure out of it and he's tried to - Oh I had a game of bridge with Omar Sharif once, on his computer cos on holiday you've got the time. I'm just not in that sense interested. I use what I have to use but em, " [Dorothy 1 G3 : 306 - 306]

[142] "Have you ever used the Internet? (Valerie, her Aunt) No.. Oh yes, I tried it out at the BT thing, exhibition." [Laura 1 G1 : 341 - 342]

[143] Psychologists would address this with the selective exposure hypothesis in Dissonance theory: People avoid particular situations and attitude-dissonant information that conflicts with their attitudes (Hewstone, Stroebe et al., 1988, p 154)

[144] James: Do you read much about the new technology and Internet or see it on the TV much? Does it come up?

Just ignore it. [Dorothy 1 G3 : 562 - 566]

[145] Mary:" No. Because I wouldn't look at that. I would never have looked at it, and I still don't look at it. I would avoid it like the plague. I don't go into shops that sell anything like that." [Mary and Terry 2 G3 : 368 - 368]

Ruth: "Well yes, I mean the computers have been there for some time and I mean people do just generally sort of creep over and use them but the people that have learned how to do it have learned at home and that's an area you see that because Maurice is working on that I don't have a, I have not had until the kids got one downstairs, there's not been a computer in the social space in the house". [Ruth 1 G3 : 431 - 431]

[146] Belk reviews some of the literature on gift giving in consumer studies and anthropological, noting the multifarious and complex gift giving situations. Gift giving can be seen as an exchange process, but also as an expression on unselfish (agapic) love. There are also issues of self gifts, gender issues, particularly noting that gift giving is 'woman's work' (Belk, 1995).

[147] Here we can recognise the 'biography of an artifact' type of analysis (Kopytoff, 1986).

[148] "Well yeah, I got a PlayStation on my birthday in September so I think I would have had it. I only had one or two games back then, I've got a few now." Aiden interview 2 Group 4

[149] "I did have [cable TV], but I found I wasn't watching it at all. When I started University I got rid of it. It was basically for Leanne and Ross. It went from £25 to £37." Bob 2 Group 4

[150] (Livingstone and Bovill, 1999) notes that many children are happy to receive hand me down TVs and VCRs to use in their bedrooms.

[151] "I mean Andy gave me a couple [of games] and I had some on line but they are far too seductive so I took them off". [Trevor 1 Group 2]

[152] blah

[153] "Video editing, if I need one I can probably borrow from in here". [Alec interview 1 Group 2]

[154] However this became less common when they were working and got their own machines:

James: Do you still go around to each other's houses to use the computer and the video games?

Aiden: No really because each of us we've all got a PlayStation.

James: Oh right you've all got - oh right.

Aiden: Ross bought one, don't know when it was he got it, roundabout Christmas time I think. Colin's had one for a while. And my little brother's got one as well so there's like two in this house alone. [Aiden interview 2 Group 4]

[155] "We have always gone out for our way not to. Laura has a cousin who has got one, so she goes and plays. She is at me for a play station at the moment, same as her friends', but I told her 'go and play on hers'". Fiona 1 Group 2

[156] "James: Are you swapping games as well.

Aiden: Yeah. so the games just get passed about between us. Ross has got Soul Blade just now. That's the most recent game I've bought. He's got it". [Aiden interview 2 Group 4]

[157] (Livingstone and Bovill, 1999) finds that sharing ICTs as part of social activities is an important young people's use of ICTs in the late 1990s.

[158] "Mary: I've said to Terry I'd like to work more on the computer with you and he said yes that's fine." [Mary 2 G3]

[159] "James: Who installs most of the games?

Joe: Dad" [Joe and Daniel, Group 3, interview 2]

[160] The telephone is a relatively stable technology for the user despite continual technical innovation in the network, and new telephone based services,. Few of the original telephone problems exisit, such as line quality, crossed lines, cut-offs in modern systems. This does not mean that there are not plenty of non-technical problems associated with the telephone, including the user interface and the quality of customer service, some of which are being solved by new technologies which in turn create new problems.

[161] In the SLIM research (Williams, Stewart et al., 2001) a colleague and I interviewed a number of school children ina group about their use and attitudes towards computers at home. All but one had a computer in the home, although some of the others were not allowed to use theirs. After the interview the girl without a computer was very upset about her family not having a machine, and not being able to afford it.

[162] Festinger's theory of cognitive dissonance][Festigner, 1957 #409] is a theory of cognitive consistency, a model of attitude organisation that assumes people strive for consistency in their cognitions. Festigner refers to this Inconsistency as dissonance (Hewstone, 1988). The existence of Dissonance is psychologically uncomfortable, and will motivate the person to try to reduce the dissonance and achieve consonance. . Dissonance results when an individual must choose between attitudes and behaviours that are contradictory. and can be eliminated by reducing the importance of the conflicting beliefs, acquiring new beliefs that change the balance, or removing the conflicting attitude or behaviour. If Dissonance is present, in addition to trying to reduce it, an individual will

actively avoid situations and information which would likely increase the dissonance. An example of dissonance applied to a consumer technology is given at http://uts.cc.utexas.edu/~chaekm/dissonance.htm by Kwimyeong Chae: “Consider someone who buys an expensive car but discovers that it is not comfortable on long drives. Dissonance exists between their beliefs that they have bought a good car and that a good car should be comfortable. Dissonance could be eliminated by deciding that it does not matter since the car is mainly used for short trips (reducing the importance of the dissonant belief) or focusing on the cars strengths such as safety, appearance, handling (thereby adding more consonant beliefs). The dissonance could also be eliminated by getting rid of the car, but this behavior is a lot harder to achieve than changing beliefs.”

[163] See earlier notes on Dissonance theory and Selective exposure.

[164] See Brosnan’s (Brosnan, 1998) discussion of anxiety in technophobia.

[165] See Roger’s three types of knowledge – knowledge of, about and principle (Rogers, 1995)

[166] For a short on-line reviews see for example (Walsh, 1998; Mediascope, 1999b; Mediascope, 1999a) or: 1994 Bernard Cesarone Video Games And Children *ERIC Clearinghouse on Elementary and Early Childhood Education, Urbana, Ill.* (http://www.uncg.edu/edu/ericcass/violence/digests/ed365477.htm)

[167] See for example the Alliance for childhood call for moratorium on expansion of computers in schools http://www.allianceforchildhood.net/projects/computers/, the Software and Information Industry Association. Report on Effectiveness of Education Technology http://www.siia.net/sharedcontent/press/2000/8-24-00.html, The National Association for the Education of Young Children 's Technology Caucus project

"Technology and Young Children" http://www.techandyoungchildren.org/ Six Myths about Young Children & Computers From the book: Young Children & Computers, A Parent's Survival Guide (http://www.childrenssoftware.com/sixmyths)

[168] When I was in the multi media course. We did the multi media and we did html and we were sort of like told to surf the Internet and see what design things are. The Internet actually doesn't interest me that much. It's like a, I think it's such a poor tool at the moment. For access it's great but it just does my head in, the speed of it. it takes you so long to, once you actually find the information, and that takes a wee while rummaging through all the rubbish that's there, once you actually find the information it takes you like forever to download it. But, I think because I'm working with it, the speed of it is doing my head in. Speed really kinda drives me mental, especially when I'm, sort of like graphics and sounds are so long in downloading. It's really multi media that I like, not so much the Internet. but there's so many good things about the Internet. If they would just get the speed up. [Andy 1 Group 2 : 719 - 719]

> This is good ones. I feel that it's as good as, in many ways it's better, but it's not as good as the one that I'm working on, like Big Bertha 'cos it's got 80 meg of ram laugh. It's a slower processor but it's 80 meg of ram so you can use, you know you can work on huge photo shot files whereas I'm trying to do this job, doing a map for some guy down in the Borders in Photoshop and it's like A3 at 300 dpi. And like one layer, just the background layer takes for ever to load, chug away and as I start putting on layers it's like panting away laugh. I was seriously considering getting a **** 84 or even 132 meg just so that I can get decent sized photo shots done. [Andy 1 Group 2 : 375 - 375]

[169] . This is described in two paradoxes suggested by Mick and Fournier (Mick and Fournier, 1998) : new/obsolete and fulfil/creates need which are relevant to rapidly changing technology: we can come to rely on technology for work or other activities, and get frustrated with limits of existing technology.

[170] The help giving relationship involves a number of components: donor characteristics (such as manipulative intent), recipient characteristics (esp. self esteem), aid characteristics

and context (Fisher, DePaulo et al., 1981; Fisher, Nadler et al., 1983; Nadler, 1987), quoted in (Hewstone, Stroebe et al., 1988, p.260).

[171] Social Learning in Multimedia, An EC financed research project 1997-2000 (Williams, Stewart et al., 2001).

[172] Now all children use computers at school, as do students, nearly all office workers, many professions have 'computerised' and home computers for education, entertainment and work were common enough at the time of the study. Even the Internet and mobile phones, relatively new products at the time, had reached 10-15% of the population.

[173] Murdoch showed the importance of local support network in the adoption of the ZX81 personal computer in the 1980s. Those from poorer backgrounds who had less contacts with other owners were less likely to persevere with getting to grips and using the machine (Murdoch, 1992)

[174] Businesses have different ways of helping people make purchases and providing after service care. Mail order and large scale providers of hardware, software and network connections generally compete on price in the first instance, and then charge a high price for service (especially in the case of free Internet providers). Smaller business, and those charging higher prices can include a more personal service as part of the package, investing more in customer care and support in return for loyalty and future business with upgrades and replacement purchases. Since the time of the study, there been some developments in customer support from large companies, in response to demand, criticism from consumer groups and a desire to gain customer loyalty. One example is PC World a large discount retailer providing weekend classes on the Internet. Another source of support are independent providers, such as cybercafes, local computer dealers, public-supported IT centres and the like. See notes in appendix 2

[175] Yeah, occasionally. If anything goes wrong or you're looking for - sometimes things, especially the kids having quite a lot of free access and things, documents get lost and put in other folders and you know, so occasionally I've had to ask how, I mean I know there's a finder thing but I can't often, I mean you often find it in something marked documents and it's supposed to be in something else. There's one person at school who's quite clued up on the computers. [Amanda2 G1 : 94 - 94]

[176] John (Group 3) is his neighbours 'technical expert': .

> The neighbours,... I sometimes get a call saying my central heating has gone crazy, can you come and have a look. I can hardly operate my own, but as it happened I had seen the system before. You push a button and your 4 choices change. So it's a question of really pushing two buttons to get the effect you want. In fairness, if you call out someone to perform the same task, £35. [John 1 Gr3 : 291 - 291]

Aiden's father (group 4) calls on his expert friends to help him when he is doing some home improvements:

> My dad still mucks about with a couple of the joiner guys he worked with, so he gets them to do stuff, like the dado rail round the hall. [Aiden 1 G4 : 173 - 173]

In her work Valerie is a senior teacher, and has to maintain her position as a local expert, not as principal source of information on curriculum developments for other staff, but to be able to have the answer in case a question arises in the course of everyday activities:

> Valerie: I read a lot more, just because of the position I am in I have to be, I feel myself I should be aware of all the new things that come in, everything, so that I can be able to pass on information to others

James Do the others see you as the person they ask

Valerie: Yes,

James: OK, Would you say that you are quite important in selecting Info and explaining it to them?

Valerie : I'm not sure whether they would say that, but I try to be so that I can pass on info if something comes up that is suitable for a particular person I pass it on, or it may be something I just keep in mind that when people.. ask me I can tell them [Valerie 1 G1 : 273 - 281]

[177] Terry: Yeah, job applications at the moment. Mary's application forms that she gets always includes one page of sort of free text that you have to say something about yourself on why you're appropriate to this job. Well you type out one and then you can modify it for the next job sort of thing. And I find the word processor is actually quite useful for that.

JKS: Do you type that?

Mary: No.

Terry: No I type it because I'm quicker. [Mary and Terry 2 G3 : 162 - 168];

[178] Working IT 2001 survey of 2000 computer professionals found “Almost two-thirds agreed that fixing a friend’s computer after work was the last thing they want to do.“ The Scotsman newspaper 27/7/01

[180] The concept of barriers I develop is not as the usual deterministic and physical concept, but enlarging the model to include four main factors that we can use to understand why people do not engage with particular ICTs or innovations: These dimensions are Practical, Relevance, Symbolic and Knowledge. This model tries to capture not only the failures of the technology to satisfy the particular needs, resources and attitudes of the consumer or user, but also the way that the individual constructs attitudes that a technology is not worth adopting.

[181] In a study looking at how we cope with new ICT innovations it is not only the reasons why people do not adopt that are relevant, but also what it is like to be a non-adopter or a non-user of technologies that are rapidly becoming common place. This covers the frustrations and the perceived benefits of not adopting and using ICTs. Finally, just as there are well described appropriation, integration and reinvention processes and strategies for the adoption of new technologies, there are also similar strategies and processes for avoiding or resisting new ICTs.

[182] Other studies such as (Aune, 1996; Livingstone and Bovill, 1999) also show that children use video games to fill time and relieve boredom.

[183] **Work and School activities associated with ICTs**

Another approach is to look at particular activities associated with ICTs, such as those dependent on communication, information management, search and creation. The study asked respondents to talk about their activities they engaged in at work, specifically these types of activities and their use of ICTs to do them. The non-adoption/non-use perspective looks to see where people did not engage in these activities, and where they did, what technologies were actually relevant and useful.

Communication

A key activity is communication at a distance. Firmly established technologies and systems of the telephone, fax, and post are now being complemented by e-mail, the mobile phone and other systems. Are there instances when these technologies are not relevant to a particular job or activity? This answer is yes, as the examples above show. The telephone is hardly used by a teacher in their professional life in a small school, nearly all official communications go though dedicated staff. Many of those who did not have a mobile phone said they could see the advantage if one travelled in ones work[183], but for themselves it was an irrelevant technology (at the prices then prevailing). E-mail was similar, only being relevant for those who needed to communicate regularly with colleagues outside their work place, such as those on the multimedia design office.

Information search

Information search and research was not a particularly important part of most of the respondents work activities. For example the teachers seldom had to look for information, but dealt with the reports and guidelines sent to them. At the time the Internet was starting to be a useful tool for research, and most of those with access used it intensively, especially in relation to new technology, and looking for information from around the world. However it had limitations for some people, notably Maura in the example above, who found it an potentially useful, but practically unwieldy tool that she could not make proper use of.

Information creation

Information creation is a rather vague term for a range of activities that involve the production of so-called information goods. These activities include writing reports, and creating media products. These are obviously activities that can use Information technologies intensively. However those people who were not expected to write reports, or who's activities did not include the creation of some sort of 'content', the technology was irrelevant.

Management of information, projects, and processes

Management of information and projects includes issues such as running a business, managing finances, managing experiments and projects IT has been extensively developed for this type of activity, and those in management positions had almost all adopted IT. . There are also many jobs that require the control of physical systems, such as Terry installing automatic testing machines in place of employing people to do the same job. Those without this responsibility have no need to adopt this technology.

[184] The Motorola "The British and Technology" Survey 1996.

[185]. Younger people also do not have the responsibilities that many adults have, and be more attracted to spending on certain new ICTs.

[186] In another study, Social Learning in Multimedia, I did research in schools about the use of a system that was being trialled to enable teachers to exchange worksheets on an inter-school network. It turned out that most teachers never communicated with teachers in other schools.

[187] *Which?On-line* Survey June 2000 http://www.which.net

[188] One study showed that the majority of people learned about the assassination of President Kennedy from word of mouth, despite the event taking over every media outlet

[189] Excellent research in this field is a study of the social construction of money and information and communication technologies in Australia (Singh, 1996; Singh, Bow et al., 1996; Singh, 1999). In particular, Singh looks at how users and potential users appropriate or resist new electronic forms of money, and how they are developing social and cultural meanings.

[190] From an interview conducted in 1996 at the respondent's office.

[191] Maurice (Group 3) found that he could use e-mail as a way of avoiding using the phone "It's very nice that's there as an extra option to communicate with her when I don't want to talk on the phone."

[192] This has certainly been investigated in depth by research on older people and technology and on telephone systems.

[193] A recent advert on the television (November 2000) picks up on the various ways that people use the phone as a way of trying to show that a mobile phone can be relevant to many different types of people – there is no longer one stereotype of user. This is an interesting development, since adverts in the past tend to focus on a particular use or a particular market (business people, women travelling alone, young people with busy social lives, parents travelling away from home etc).

[194] However, see the discussion of re-occurring events, such as Christmas in the chapter on how people adopt.

[195] Rosenburg suggests that postponement of adoption is often logical, as early product versions are not well adapted to specific needs, cost too much, have many bugs to be ironed out: “Expectations of continued improvement in new technology may therefore lead to postponement of an innovation, to a slowing down in the rate of its diffusion, or to an adoption in a modified form to permit greater flexibility. Moreover one must consider expectations relating not only to possible improvements in the technology being considered, but also the possibility of improvement in both substitute and complementary technologies.” (Rosenberg, 1983, p.114)

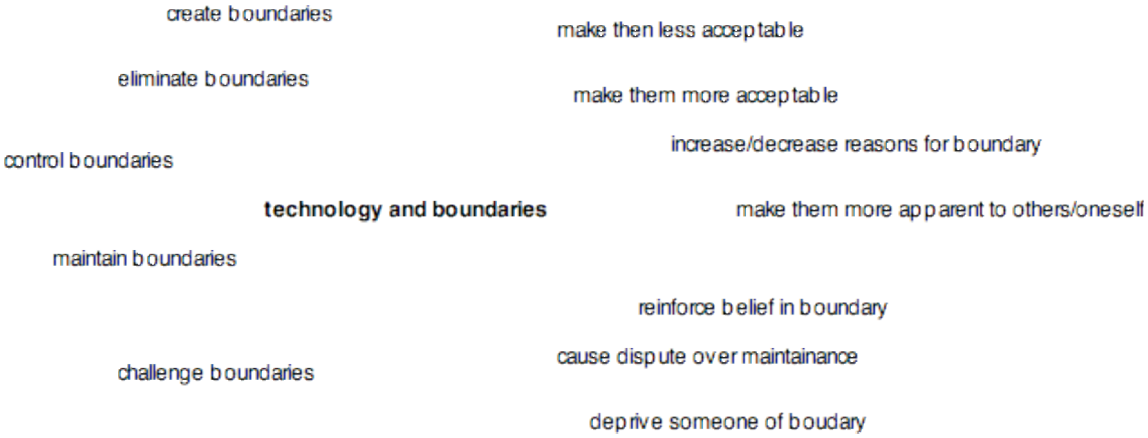
[196] Not to be confused with the *barrier method!*

[197] Between 1996 and 1997 men’s expectations did not change, but women’s increased from 46% to 55%, showing a considerable change in attitudes and pressure to adoption.

[198] Recalling the discussion in (Bauer, 1995b) compared with resistance to Nuclear power and weapons, to computerisation in the 1970s, and the genetic technologies today.

[199] As Goffman famously described in the Presentation of Self in Everyday life (Goffman, 1959)

[200] Boundaries and Technology:



Recall also the previous note on computer professional not wanting to do computer work at home.